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Including the Railroad Gazette and the Railway Age

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A GENEROUS and wealthy citizen of a city gives a half million dollars to erect, to endow and to supply artistic material for a local art gallery. The grateful city hails him as a benefactor, releases his gift from taxation and points to it with pride as an uplifting asset to the community. In the same city an old terminal railway station is outworn and outgrown by the demands of passenger traffic. Public sentiment instantly and urgently insists that the new station shall pay architectural tribute to the "city beautiful," as the local pride of phrase—if not of fact—runs. The typical civic attitude is that of Kansas City, where the authorities have insisted that $1,000,000 or so should be spent on architectural and other adornment of a new Union Station if the permit to erect it is yielded. Utilities, public convenience and comforts are not enough. There must be added the esthetic and artistic ministration to the popular vision. In greater or less degree this idea ranges from the city of 10,000 up to the city of millions, where it expresses itself in the hundreds of thousands of dollars that span the gap between a station's plain exterior and a frontage of pillared grandeur and costly carving. Moreover, this ornate feature is not only exacted, but taxed also. Even if not assessed locally it pays its tribute to Caesar in the tax on the new stock or bonds which the added cost connotes; and, under some of our systems of taxation, it is lucky if it escapes taxation twice over. It may be admired and praised as a "credit" both to the city and to the railway corporation, but the credit never reaches the tax books of state or municipality, and the decorative structure must take its place in the final assessment along with the most hideous and lucrative sky-scraper. But, turning to another aspect of the matter, where do the aggregated millions expended by our railways in such public art embellishment take their place in a theory of revaluation? Are they a normal part of "replacement," are they vested with earning power and, if so, how much? Are they to be charged up to Utility or exempted as fine Art? Are they to be capitalized in dollars or in the more nebulous units of public sentiment and good will? These are economic enigmas that would puzzle a new Hadley Commission.

THE Block Signal and Train Control Board, a body which, in its four years' service at Washington, has made for itself a reputation for conservatism, in its annual report, which was noticed in the *Railway Age Gazette* of February 2, comes out in favor of the use of automatic train stops "in a great many places" on American railways; and says that, although no apparatus of this class has yet been fully developed in such a way as to be thoroughly adapted to the needs of general railway service in the United States, still there is no reason why a satisfactory device cannot quickly be developed, when once the attempt is made. The grounds on which the board bases this radical conclusion are not given in much detail, but may be summed up in the declaration that satisfactory apparatus is available, or can be made so, and that the need is urgent. It refrains from recommending legislation to require the use of automatic stops, because there has not been enough experience with them under the varying conditions of steam railway operation to, in its opinion, justify such legislation. It does believe, however, that the roads should be expected and urged to develop the art of automatic train control, and that if this is not done with "a reasonable degree of expedition, steps should be taken by the government to stimulate action." The fundamental question to be considered is whether, under the ordinary conditions of railway operation, automatic train control, even if approximately perfect, would be desirable, either generally or, in the board's language, "in a great many places." Numerous railway operating men contend it would not be; but no American railway organization in this country has ever made a thorough study of the subject, although some have been urged to do so. The next question, in point of importance, is whether apparatus which will work satisfactorily under varying conditions exists; and the Block Signal and Train Control Board, whose members have investigated the subject more thoroughly than any other persons, whether in or out of railway service, answer substantially in the affirmative. It would seem, therefore, that the subject of automatic train control has reached a place where it is entitled to receive more intelligent and serious attention and investigation from individual railways and railway associations than it has heretofore. A swarm of experimenters having stop devices with stock jobbing appurtenances is trying to agitate the public; and unless the railways take steps which either will refute the contention of the Train Control Board that automatic train control is practicable and desirable, or will demonstrate its practicability and desirability and show a dispostion on the part of the roads to make use of it wherever expedient, they are in danger of becoming the victims of unwise, hasty and harmful legislation on the subject.

IN connection with the last report of the Southern Pacific Company, some of the analogies of electric extension of two large railway systems on the Pacific and Atlantic seaboards, respectively, deserve attention. The electric system of the Southern Pacific around Los Angeles and in other parts of California comprises approximately 1,065 single-track miles; and the company has in addition nearly completed electrification of former steam roads leading to its San Francisco ferries. Purchase of electric lines has accompanied the electrifying of old steam lines. Similarly, but beginning at an earlier date, on the Atlantic seaboard the New Haven has developed electric purchase and operation. It owns or controls some 1,300 miles of street railways, and operates by electricity about 200 miles formerly operated by steam. The only difference between the electric ventures of the two companies is that while the Southern Pacific has parted with some of its street railway investments, the New Haven has held its investments of this kind steadfastly; and, also, the New Haven has electrified part of its main line. While financial results thus far, in the absence of official returns, are somewhat obscure, they suggest the decided success of the electric investments of the two corporations. Thus, the returns of the Southern Pacific's holding corporation, the Pacific Electric Railway Company, operating 881 single track miles, indicate a return of probably about $600,000 over cost of operation and fixed charges. As contrasted with the Southern Pacific, the New Haven makes no returns for its street railways and, for legal reasons, does not openly concede ownership of some 400 miles in Massachusetts vested in a holding corporation. But it can be stated unofficially that, in spite of a very great percentage of water poured into the capitalization of the Connecticut and Rhode Island street railways before the New Haven bought control, the 1,300 miles of street railways as a whole are now practically liquidating the investment. The purchase of the electric properties by these two corporations, must not, however, be tested by the immediate investment and the returns alone. There must be counted in the tendency toward rapid increase of street railway earnings and, more important than that, the value of the control itself to the proprietor corporation in the profitable adjustment of traffic relations between the steam and electric lines. If to the electric investment of the Southern Pacific and the New Haven we add that of the New York Central and the Delaware & Hudson, we shall have about 3,000 single-track miles of electric roads operated directly or indirectly by four large steam railway corporations. So great an investment, and under somewhat diverse conditions of operation, forecast instructive results ere long when the proposition of steam railway purchase of electric lines is more fully worked out.

THE SHIPPERS AND UNIFORM CLASSIFICATION.

SOME of the reasons why railway traffic officers contended for years that a uniform classification of freight would be impracticable were given forcible illustration recently during the hearings in Chicago before the board of suspension of the Interstate Commerce Commission on the new issue of the Western Classification. The changes which aroused the railway commissions of nine states and numerous shippers to stormy protests and a demand for its suspension were largely the result of the work of the Uniform Classification Committee. This, in turn, has been largely due to protracted agitation for a unification of classifications on the part of shippers and the Interstate commission. Naturally, the railways have not sought to achieve uniformity by invariably making alterations that would entail a reduction of their revenue; and as they have taken advantage of the opportunity to eliminate many long-standing discriminations, the advances in the classification numerically exceed the reductions. The roads estimate, however, that the traffic affected by the reductions is 33⅓ per cent. greater than that affected by the advances. Naturally, also, human nature being constituted as it is, the large number of shippers who would be benefited by the changes were conspicuous by their absence, while those who feared they would be hurt were present, vigorously protesting. Thus far the Uniform Classification Committee has not tried to effect actual unification of the ratings in the three classifications by moving articles from one class to another. The committee has tried merely to make a beginning by commencing to establish uniform rules, descriptions of articles and minimum carload weights. If the storm of protest with which this first step toward unification is met is any indication of what the railways must face when the changes in the ratings themselves are undertaken, the former lack of enthusiasm on the part of the carriers toward all suggestions for uniform classification will appear to be justified.

The railway commissioners and the shippers practically ignored the fact that the committee's proposals expressed sincere effort to comply with the demand for uniformity. Instead, the burden of their protests, both at the hearing and in their newspaper interviews, was that the railways were seeking "by subterfuge" and by "juggling" to effect an advance in millions of freight rates, in contravention of the decisions of the Interstate Commerce Commission in the rate advance cases. Suspension of the classification for 120 days was demanded on the ground that the shippers had been given but a few days, since its publication on December 30, in which to examine it and determine its effect on their interests, although uniform classification has been agitated for over twenty years, and although the railways have been accused by the Interstate Commerce Commission and shippers themselves of dilatoriness in trying to effect it, and the complete docket of the Western Classification Committee was made public before its Milwaukee meeting last July, when the shippers were given a hearing in its provisions. A member of the Oklahoma commission almost in the same breath protested the impossibility of checking the classification in the time allowed and "estimated" that it would increase the revenues of the carriers by from $20,000,000 to $40,000,000!

Uniform classification has not been of the railways' seeking. One of the earliest demands of the Interstate Commerce Commission after its creation was that a single classification be substituted for the three then, as now, in effect in eastern, western and southern territory. The railways felt that they had accomplished a difficult task in reducing to three the multifarious classifications previously in effect; and traffic officers long contended that varying commercial and transportation conditions in different territories rendered complete unification neither practicable nor desirable. The agitation for it was continued by shippers, and carried to Congress, and in 1907, after the commission had intimated that unless the railways undertook the task it would do so itself, the roads appointed a committee to do the preliminary work and determine the principles on which a uniform classification should be framed. After a thorough study this committee reported, in 1908, that "while the establishment of a uniform classification is impracticable at this time it can ultimately be worked out along intelligent and satisfactory lines." It added:

> "It is evident that material advances and reductions would result from unifying ratings in the several territories, the effect of which on revenue cannot be determined until the new rate scales are made to conform to the ratings of a uniform classification, and applied to traffic moving during a representative period of time by individual carriers."

As to the effect on trade, the report said:

> "It must be apparent that the numerous advances and reductions in rates which would result from a uniform classification would not fail to have influence on the trade conditions of the country, the extent of which could not be determined until new rate scales are made to conform to the ratings of a uniform classification, and the mercantile and industrial interests of the country have applied them to their business."

In the same year an executive committee and a working committee were formed, the latter to undertake the unification of rules, descriptions of articles and minimum carload weights, which must under any plan of unification precede the making of uniform ratings. This committee has been at work in Chicago since the fall of 1908. It has secured detailed information re-

garding the character of traffic and transportation conditions from all classes of industries, has given hearings at various times to representatives of those industries, and has made frequent reports of its progress to the committee on uniform classification of the National Association of Railway Commissioners. This association is composed of the state and interstate commissioners. The agricultural implement manufacturers, so much in evidence at the Chicago hearing, were given a hearing by the uniform committee as long ago as July 27, 1909.

Although the railways' committee has been in continuous session, it frequently has been criticised by shippers for having made too little progress. The Interstate Commerce Commission in its last annual report to Congress expressed the opinion that there can be no permanent uniform freight classification without a law requiring the railways to adopt and maintain it, and recommended legislation requiring this within five years.

Last year the Uniform Classification Committee submitted the first part of its work in the form of recommendations to the three classification committees for adoption. It was deemed advisable to attempt the unification gradually, rather than to wait and try to bring about complete uniformity at once. In reaching this decision the carriers acted on the suggestion and had the approval of the committee of the railway commissioners' association. Approximately 50 per cent. of the recommendations of the Uniform committee were adopted by the Official Classification Committee, about 75 per cent. by the Southern Classification Committee, and about 90 per cent. by the Western Classification Committee.

Undoubtedly some of the more powerful shippers' organizations have been led to demand a uniform classification by the shrewd hope that such a readjustment would result in a general lowering of rates. In view of the fact that all the elaborate machinery of government regulation of rates, in this country, which was really called into existence mainly for the purpose of correcting discrimination, has not developed any more scientific method of removing discriminations than by the reduction of the higher to the level of the lower rate, this hope would seem not to have been entirely without foundation. The Interstate commission, however, and the more thoughtful of the traffic experts in the employ of the shippers, have advocated uniformity, not for the purpose of lowering rates, but to improve the conditions attendant upon the shipment of articles from one classification territory to another.

Railways have been charged with, and too frequently have been guilty of, making some rates unreasonably low, and some classification provisions with undue liberality, to favor particular persons or localities. In other instances persons or localities have been given more favorable rates or classifications than others, because of differences in geographical, commercial or transportation conditions without exposing the railways to any fair charge of unreasonable discrimination. Uniformity necessarily means removal of these discriminations, whether fair or unfair. If the carriers are not to bring about unification by the simple process of reducing all rates to the level of the lowest, which would bankrupt them, the framing of a uniform classification must be done with a give-and-take spirit, some rates being revised upward, and others downward.

Many discriminations formerly accomplished by rebates have been continued in the provisions of published tariffs and classifications, and many descriptions of analogous articles in the classifications have been so worded as to permit the evasion of their clear intent by slight misrepresentations in the billing practically impossible of detection. In adopting the recommendations of the Uniform committee the Western Classification Committee has included many provisions that will cost certain shippers more money, while putting all shippers on a more equal basis by removing discriminations that ought to have been eliminated long ago. At the same time, it has made many changes which will greatly benefit others. The number of items in the classification which represent advances exceeds the number of reductions, but the number of items has but little practical significance. No one will know how the actual movement of traffic will be effected until the classification has gone into effect. The purpose of the railways has not been to increase rates, but to correct discrimination, to effect uniformity and to increase traffic.

Some shippers and some industries are bound to be hurt in the process. In asking a suspension of the classification for the benefit of those who are adversely affected, the railway commissioners have also sought to delay the advantages that would be gained for others of their constituents. Commercial conditions undoubtedly will be disturbed by extensive changes in classification, as the railway committee predicted in 1907. But it is commonly understood that commercial conditions were considerably agitated over a somewhat wide area when rebates were abolished in 1906. In fact, they were so much disturbed that many of the former beneficiaries of illegal preferences in rates have not yet ceased to demand their continuation in the form of reduced rates. Even when the removal of discrimination is accomplished by the reduction of the higher rate to the level of the lower, the change is likely to arouse the criticism of the man who has benefited by the former discrimination and whose rate is not reduced also.

It was only to be expected that shippers whom a beneficial arrangement for mixed carload shipments has allowed to do a less-than-carload business at carload rates should "view with alarm" an effort toward the restriction of the mixing privilege which other interests have long demanded. For example, it is entirely natural that those who for years have had the advantage of a classification of binder twine with plows and harvesters instead of with ropes and cordage, and have thereby been permitted to pay carload rates on half a carload of agricultural machinery and half a carload of twine, should object to the abolition of the privilege. In this case, they objected so hard that the committee agreed to restore the privilege, on the showing that many small dealers had already made contracts for their season's supply. It was to be expected also that those who have been enabled to secure low rates by taking advantage of technicalities in the descriptions which were too refined to be efficient or fair should protest, because the committee has sought to remove the temptation to and opportunity for misbilling by grouping analogous articles under a single description. Candy, for example, has heretofore been given two ratings. If valued at less than 15 cents a pound it has been rated in the third class. If given a higher valuation it has been charged the first class rate. Quite naturally those who by the simple expedient of declaring their candy to be worth less than 15 cents a pound have had an advantage over those of their competitors whose honesty or fear of prosecution has restrained them from misbilling object when all candy is put in the second class.

Every point raised by the shippers or state commissioners at the hearing represented the view of local or particular interests. They were met by Robert C. Fyfe, chairman of the Western Classification Committee, with facts and figures showing the reasons for the changes over the entire territory involved. The representatives of the Interstate Commerce Commission also displayed a strong spirit of co-operation with the effort toward uniformity. But without the co-operation of the shippers who will benefit by the proposed changes a uniform classification seems far off, indeed. It might be a good idea to have a representative of the Interstate Commerce Commission sit with the Uniform committee hereafter to keep in close touch with the progress of its work. Such a plan would have the advantage of familiarizing the commission, and through it the shippers, with some of the difficulties that must be overcome and with the means adopted to overcome them, and the reasons for their adoption.

THE RAIL SITUATION ONCE MORE.

THE question whether the United States Steel Corporation, at least is making safe rails would seem to be no longer open to discussion. Complaints by railway managers regarding rail breakages recently have been widespread. This is the railway side of the case. On January 22, testifying before the Stanley committee, Mr. Farrell, president of the United States Steel Corporation, said:

"The carbon is so high that we get the brittle rail. It is true that many of these hard rails never break, but the liability to breakage is much greater than in the old time softer rails, and the influence of the unavoidable contingencies of manufacture, such as seams, pipes and segregation, is much greater. In many respects the steel is more doubtful, more dangerous and more treacherous. It is unquestionably, in my judgment, an unsafe grade of steel in view of the severe conditions of service."

This is the official view of the Steel Corporation. When the *Railway Age Gazette,* in an editorial in its issue of December 15, entitled "What Are the Railways Going to Do About Rails?" criticized the rails now in service and being put in service, its statements were challenged by railway men and persons connected with the steel companies. No one seems to challenge them now.

While there is agreement that the rails being made are unsatisfactory from the standpoint of safety, there is disagreement as to why this is so. Mr. Farrell puts all the blame on the roads. He says that commencing about 1890 they began to ask for higher carbon in rails in order to get greater wear, and that the rail makers, unwisely and many times under protest, made the quality of steel demanded. "Gradually the specifications called for still higher carbon until today I believe the steel is within the danger zone of brittleness." The steel manufacturers, he added, are now druggists; "they are dealing with prescriptions from the railway." The implication of all of which is that the steel companies are making rails just as the railways ask them to.

Now, the fact is that over three years ago, after much study and deliberation, the American Railway Engineering and Maintenance of Way Association drew up a specification according to which it believed good rails could be made, and submitted it to the representatives of the steel mills; and that the steel companies rejected it. The specifications under which rails are being made now differ in essential particulars from those according to which railway managers indicated to the steel companies they thought they should be made; and at this very time railway engineers are pressing for changes in the specifications—with what results remains to be seen. As to Mr. Farrell's assertion that the trouble is due to excessive carbon, only three or four large railway systems are having rails made according to specifications in which the carbon varies to any considerable extent from that in the steel companies' own specification. Among these are the Pennsylvania Railroad and the Harriman Lines. The Harriman Lines' specification calls for .07 more carbon than do those generally used, and the Harriman Lines are suffering a smaller proportion of rail breakages, according to the statistics on the subject, than most of the railways of the country. Prior to the organization of the United States Steel Corporation in 1901 the specifications in general use provided for .45 to .55 carbon. In 1904 the manufacturers voluntarily adopted a specification which raised the carbon content to .50 to .60. There followed in 1905 and 1906 a flood of bad rails; and it was after protests from the railways that the mills in 1907 adopted the drop test and restored the carbon content to what it was prior to 1904, and has been since.

The investigations and experience of railway engineers have led most of them to believe that the defects of rails which result in breakages are due in much smaller degree to shortcomings of the specifications and chemical composition than to bad mill practices. One road which recently made a careful analysis of over 500 rail failures found that 95 per cent. of them would have been prevented by good practice in manufacture. If the trouble is with the specifications it is inexplicable that under the same specifications, one of the Steel Corporation's own largest mills makes rails which break twice as often in proportion as do those made by another of its largest mills. If, on the contrary, rail failures are chiefly due to excessively fast rolling or other defects of mill practice, the fact that the record made by the rails from one of these mills is very much better than that made by those from the other is easily understood.

Mr. Farrell implied that one of the remedies for the situation is for the railways to buy heavier rails. But as the statistics we published in an editorial in our issue of January 12 show, breakages of 85, 90 and 100-lb. rails are more numerous in proportion than are breakages of 75 and 80-lb. rails. He also suggested that the carbon content be reduced, thereby producing a softer rail. He said that a softer rail would not break so easily, but conceded that, of course, it will wear out faster. He might have added that track laid with soft rails very much sooner becomes irregular, causing rough riding of trains, which necessitates frequent rail renewals. How much breakages would be reduced by the use of softer rails is uncertain; but that the softer rails would have to be renewed much faster, thereby increasing the operating expenses of the railways—and the earnings of the steel companies—is certain.

Mr. Farrell also said that to get satisfactory rails the roads probably must pay more than $28 a ton. He unquestionably was right in contending that safety of transportation is more important than cheap transportation, and if, as he asserted, it is necessary for the railways to pay more to get safer rails, they ought to do so. Before we conclude that the railways should pay more, however, a glance back into history is desirable. The average price of steel rails in the United States in the ten years from 1890 to 1899, inclusive, was $26.02. In 1894 and 1895 it was $24; in 1896 it was $28; in 1897 it was $18.75; in 1898 it was $17.62, and in 1901, the year the Steel Corporation was formed, it was $27.03. In those years the mills gave the railways a guarantee that rails would last at least five years. The roads, under the competitive conditions in the steel business then existing, could also buy from any mill they liked. Soon after the Steel Corporation was formed the price was fixed at $28, and it has stood there ever since, while the prices of other steel and iron products have fluctuated more or less in accordance with supply and demand. The railways were told that it was necessary to charge $28 to make good rails, the implication being that they would get good rails for this price. A little later the five-year guarantee was withdrawn. At about the same time the Steel Corporation put a provision in its contracts that orders for rails might be filled by it from any of its mills that it chose. Meantime, the railways and public were being assured that the union of numerous mills by the United States Steel Corporation, and its acquisition of railway lines, steamship lines, ore mine leases, etc., would effect economies in production that would benefit the public much more than did the competitive conditions existing previously in the steel business. Subsequently, also, Mr. Carnegie and Mr. Schwab, testifying before committees of Congress, have said that steel rails can be made cheaper in the United States than anywhere else on earth; and the commissioner of corporations, Herbert Knox Smith, in a recent report, says that the Corporation's "book cost" of making Bessemer rails is $21.27, that, excluding $2.47 inter-company profits, the revised cost is $18.80, and that the profit at $28 a ton is 11 to 17 per cent. on the investment.

And now, after all this, Mr. Farrell tells the Stanley committee that the price of $28 a ton is inadequate; that the cost of production has been steadily increasing for ten years, until rails can be produced more cheaply abroad than in the United States; and that if the railways are to get good rails they must pay more for them. In view of the foregoing facts we submit that the burden of proving that the price of $28 a ton is adequate is not on the railways; but that the burden of proving that it is not adequate is clearly on the Steel Corporation. If the cost of production has been constantly increasing, what has become of all the economies which were to result from the formation and operation of the Steel Corporation?

The only way to determine whether it is necessary for the

Steel Corporation to get more than, or even as much as, $28 a ton for safer rails, is for it to make them, and then open its books and show how much the making of them actually costs. The investigation should not be made by the commissioner of corporations or committees of Congress, who know nothing about rail-making, and in whose eyes it is easy to throw dust, but by experts. And it should include an inquiry into *all* the expenses involved. For example, the Steel Corporation owns in Minnesota two short ore-carrying railways, the Duluth & Iron Range, 168 miles long, and the Duluth, Missabe & Northern, 293 miles long. In the fiscal year 1910 the gross operating revenues per mile of the Duluth & Iron Range were $56,686; operating expenses, $20,720; net operating revenues, $35,966; operating ratio only 36.55 per cent. The gross operating revenues of the Duluth, Missabe & Northern per mile were $48,064; operating expenses, $14,402; net earnings, $33,662; operating ratio 29.96 per cent. In the same year the figures for the Pennsylvania Railroad in the east and the Union Pacific in the west—two of the greatest and most prosperous railways in the United States—were as follows: Pennsylvania, gross operating revenues per mile, $40,149.50; operating expenses, $27,582; net operating revenues, $12,567.50; operating ratio, $68.70 per cent.; Union Pacific, gross operating revenues per mile, $15,594; operating expenses, $7,936; net operating revenues, $7,658; operating ratio, 50.89 per cent. The figures for the railways of the United States as a whole were: Gross operating revenues per mile, $11,607; operating expenses, $7,691; net operating revenue, $3,916; operating ratio, 66.3 per cent. The figures for the Steel Corporation's railways are out of all proportion to those for the other railways of the country, although, like other railways, they are common carriers; and the rates on ore from which their earnings are derived enter into the figures on which Mr. Farrell bases his statement as to the cost of making rails in the United States, while the profits from them go into the Steel Corporation's treasury. These figures clearly indicate the need for "going back of the returns" of the Steel Corporation in investigating the price it is entitled to receive for rails.

Chairman Gary, in his testimony before the Stanley committee, as has been pointed out in past issues of this paper, conceded, in effect, that the Steel Corporation is essentially a concern engaged in rendering a public service and should be regulated like railways. On this theory, it owes the same public duty to make safe rails that the railways do to give safe transportation; and it is not entitled to get any larger profits from making them than the railways are from using them. Certainly its railways are not entitled to get any larger profits from carrying the ore going into rails than the railways are from using them. The Steel Corporation, by the admission of its president, has not been and is not now performing its public duty of making safe rails. His attempts to put the blame on the railways fail, for it was because the steel companies were making poor rails that the railways began insisting on improvements in specifications and mill practice—improvements they have as yet been unable, chiefly because of the monopoly conditions in the steel trade, to obtain—improvements which the steel companies, in view of their public duty, and of the fact that they are dominated financially by the same men who dominate in the financial affairs of many railways, ought voluntarily to make, but which all the pressure the executive and engineering officers of the railways can bring to bear has as yet been inadequate to secure. Any way, why should it be necessary for the railway to tell the steel companies how to make good rails, any more than it should be necessary for shippers to tell the railways how to furnish good transportation. By the attitude they have assumed and are maintaining on the rail question the steel companies, and especially the Steel Corporation, are playing directly into the hands of those who demand the complete destruction of practical monopoly in the steel business and of the close financial relations that exist between the steel companies and large railway systems.

THE ATTITUDE OF THE COMMISSION AND OF THE RAILWAYS.

THE comments of "Old Railroader" in another column on the proposition that the Interstate Commerce Commission be given power to fix minimum rates are interesting from several points of view. He contends that the railways do not want to discriminate in favor of the "big shipper," and asks why the commission does not help them. The tone of his letter is almost an answer to his question. The members of the commission are at least human. Are they very likely to help a man who follows his request with a denunciation? "Old Railroader" may not know it, but the reverse question has been put. More than one member of the Interstate Commerce Commission, in discussing questions of this kind, have asked "Why do not the railways help us more?" And they point to cases large and small involving questions of discrimination, where the railways have presented no testimony or have testified in favor of the "big shipper."

The best answer, however, to "Old Railroader's" letter is to say that the commission is helping as much as it knows how. The best instance of this is the recent decision in the case of the Durham & South Carolina. "Interstate Commerce Commission 1694. In the Matter of Division of Joint Rate for Transportation of Coal to points in North Carolina from points in other states." In this case the commission finds as follows:

"The Durham & South Carolina, being owned by a corporation which owns the main industry on that line, can not receive an allowance such as that here given without its being in effect a rebate on the traffic of the allied industry which moves over the Norfolk & Western for or to the Durham & South Carolina. . . . The Seaboard Air Line bought the business of an industry, or of a group of financiers having large traffic at their control, by allowing its traffic at one point to be taken away from it by a road under the management allied to that of the industry. Here then, at Durham, we have two great trunk-line railroads bidding for traffic into Durham by allowances to industrial roads. They voluntarily reduce their own revenue through divisions with these industrial roads for the sake of gaining traffic. . . . The large stockholders in the Durham & Southern by their control of industries induce the Seaboard Air Line to build up the traffic of a rival road, the Durham & Southern. If there is a dollar over and above the actual cost of transportation in the 40 per cent. division which the Durham & Southern gets it goes into the pockets of the Dukes; it is not a rebate given to the American Tobacco Company, but confessedly is an advantage growing out of the relation between the Dukes and the tobacco interests, for if the Dukes did not have freight to route the traffic manager of the Seaboard says that no such arrangement would have been made. There may be some doubt as to the power of the commission to correct a situation such as this, but whatever power the commission has it should exercise. An order will be issued against the Seaboard Air Line citing it to show cause why its rates into and out of Durham on all classes and commodities should not be reduced, and against the Norfolk & Western that it show cause why its rate on coal into Durham should not be reduced."

In accordance with this decision, the Norfolk & Western and the Seaboard Air Line were ordered by the commission to show cause before February why their Durham rates should not all be reduced, presumably by the amount of the allowances given to the "big fellows."

The allowances in question are considerable. The Durham & Southern, for instance, is receiving from the Norfolk & Western 69 cents to haul a ton of coal less than two miles; this is about 35 per cent. of the rate. The Durham & Southern is receiving from the Seaboard 40 per cent. of the rate for a twenty-mile haul. It was evidently the thought of the commission that this threat of a general reduction of the Durham rates, 35 or 40 per cent., would result in inducing the railways to withdraw the allowances in question, and thus eliminate what is considered a discrimination. Certainly the Durham rate could not be cut in this way without affecting the whole southern rates schedule most favorably, and a general reduction of anything like this percentage would spell bankruptcy. The remedy looks heroic, and whether it comes or not, the commission certainly has demonstrated that it desires to "help the railways" in this matter, even if it does not choose the exact method which the railways might desire.

This settled, the question arises—why should there be this

misunderstanding? Why should not "Old Railroader" appreciate that the commission wants to help him? Why should he couple his appeal with abuse? On the other hand, why does not the commission know that the railways want help, and why does it make the acceptance of its "help" so difficult? In fine, why are the commission and the railways so far apart?

One might as well ask why there are still in the South old ladies who hate a Yankee, and why the "bloody shirt" has been waved in the North within a few years. There was a state of war between the railways and the commission for twenty years, war in the courts, to be sure, but war all the same; and the early victories were with the railways. We are now in a period of reconstruction, and of rapid reconstruction. But there are so many old scars left on both sides, and there are many old wounds which re-open when the surgeon is rough—sometimes, indeed, when he means to be tender.

An unprejudiced person would probably say that, as conquerors go, the Interstate Commerce Commission is a very decent conqueror. Whatever its lapses in administration and legislation, it certainly has not been actively oppressive, despite quite a little provocation from the conquered. But the modern scale is high. A good deal is expected of conquerors nowadays. One of the members of the commission had some forty odd years ago a personal experience of "reconstruction." Will he not explain to his colleagues what qualities are most appreciated in conquerors?

One chief obstacle in the way of bringing the commission and the railways to a closer understanding is the fact that most of the strong men in the railways have, by their very quality of strength, been most deeply involved in the twenty-year war with the commission. They are the men who can help the commission most, and many of them consider themselves especially persona non grata. On the other hand, the clever men in the railways have many of them been engaged in putting the commission into one or another hole, and they feel—justly or not—that the commission does not trust them, and that it will take years of frank dealing before they can become useful.

The personnel of the commission, however, is not thoroughly committed. Many of the members have been appointed since the worst part of the war, and none of them served all through it. They are all politicians of one or another kind, and as such are all men of a good deal of tact. We can hardly conclude that the commission ought in every case to take the first steps to secure an understanding. There is plenty of room for both sides to make approaches. Doubtless such approaches are being made. It is to be hoped that they will be more frequent and will lead to a more perfect understanding.

NEW BOOKS.

Suspension Bridges and Cantilevers. By D. B. Steinman, C. E., Assistant Professor of Civil Engineering, University of Idaho. D. Van Nostrand Company, New York. 4 in. x 6 in. 185 pages. Price, 50 cents.

Engineering literature contains very little adequate data from which to determine the economic and limiting spans for cantilever and suspension bridges, although comparative designs of these two types of long-span bridges have been prepared in certain instances for particular local conditions. The treatment by Mr. Steinman is intended to make a general comparison for the purpose of establishing the relative economic or limiting span lengths. This comparison involved the determination of the maximum practicable spans for the suspension and cantilever types, the maximum economic spans for the suspension and cantilever types, and the span of equal cost for the two types. The method adopted was to compare existing and new designs and estimates covering a wide range of both types of bridges, from which to deduce empirical laws of the variation of weight and cost with the length of span. The determination of cost curves indicates the comparative economy at different spans as well as the critical span of equal cost.

Letters to the Editor.

"ABOLISH THE PRESENT GIVING."

Ottawa, Ont., January 17, 1912.

To the Editor of the Railway Age Gazette:

The discussion on the question of the supply men giving, and railway men receiving, gifts is fine. No one will for a moment claim that the practice is right. But it is amusing to see the fellows "hunt cover." "The wicked flee when no man pursueth." That one from the ex-purchasing agent reminds one of the fable about the fox and the tail he lost. The truth about the matter is that the small fry will now be largely cut out of the Christmas giving, but the big fellows will continue to get theirs just the same, or a little more. This is right and according to Scripture, for "to him that hath, to him shall be given." If we have been dishonest in this matter in the past, let us be honest now, and not play the hypocrite. The principle of the thing is wrong, always has been wrong, and can never be right. Some have accepted gifts, and reciprocated, knowing they were expected to do so. Some have received them, and did not reciprocate. Others have persuaded themselves that the gifts were a mark of personal regard. They were all dishonest. But let us be honest now, and cut it *all* out. It is a matter that rests with the supply people, not the railway men. There may be one or two men in the thousands of railway men who would try to "hold up" a supply man; but how long would it take that supply man to have such a man removed? It is up to the supply man. Let us see if they can trust each other enough to "cut it out."

E. J. M.

THE INTERSTATE COMMERCE COMMISSION AND UNFAIR DISCRIMINATION.

New York, January 20, 1912.

To the Editor of the Railway Age Gazette:

The editorial in your issue of January 12 proposing that the Interstate Commerce Commission be given the power to name a minimum rate is all right in theory. With such a power, the commission could increase discriminatory rates like those you cite, and could thus end such discriminations.

But there are practical difficulties. First, Congress is not at all likely to take action which would result in the increase of a single rate. Second, if the commission had this power it would not be at all likely to use it, as it could and should be used.

I take it there is no doubt as to the truth of my first proposition. In proof of the second, let me remind you that the commission has a great deal of power which it could use in this direction, which it is not exercising. Why should we expect it to exercise new powers any more diligently or intelligently?

The railways do not in general want to make such rates as those you allude to; certainly none of the railways involved want to maintain them now. Presumably the road which first cut the copper rate to the seaboard profited thereby, but now that all the other roads have met the rate, that advantage is gone. The same statement is true, or almost true, of the packing house rates from Kansas City. Certainly if the railways were not afraid of the big shippers the rates would go back to a reasonable point at once. Such discriminatory rates are excused as the "result of competition." In point of fact, they are largely the result of monopoly, only the monopoly is not with the railways. Every one knows that these rates were forced on one or another weak railway by a kind of persuasion that is now illegal.

The commission must know this, and it must know that the big shippers maintain their illegal advantage by illegal solicitation. Why doesn't the commission go ahead and encourage the railways to wipe out their illegal rates, instead of sitting back and doing nothing except jockey for more power, or at best secure indictments against railways, not shippers, on absurdly small and technical points?

OLD RAILROADER.

THE SUPPLY DEPARTMENT AS A MEANS OF ECONOMY.

CHICAGO, January 26, 1912.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

The second article in the series of Opportunities for Economy on Railways, which appeared in the *Railway Age Gazette* of December 22, 1911, deals with a subject which has attracted the attention of railway managers more and more in recent years, but on the average railway there is still room for more real improvement and economy in the supply department than they seem to fully comprehend.

I am particularly pleased at the importance which Mr. Fritch attaches to this question, because it seems to show that good seed which falls by the wayside will sometimes bring forth a harvest. The writer, however, while he has touched upon a most important subject, has apparently not had either time or opportunity for more than a superficial study of the question. The views which he expresses in regard to the organization and the methods to be employed in promoting the efficiency of the supply department are not those of one who has had any very intimate experience with its operations. As one gentleman described it: "He has heard a bell ring, but has not located it." The bell was rung in an article on Suggested Possibilities of Supply Department Management, published in the *Railway Age Gazette* of July 30, 1909, and the reverberations are caught up and re-echoed in the introduction of Mr. Fritch's article.

What he says in that introduction cannot be gainsaid. The facts are apparent even to the casual eye. The method suggested for instituting a comparison between the operations of different roads with respect to their supply department performance is, perhaps, not as good a one as could be devised, but the idea sought to be conveyed is sound. The use of operating expense in the manner suggested, as a factor in determining the efficiency of the supply department, amounts to putting a premium on extravagance in management so far as that particular feature is concerned; for the higher the operating expense per mile the greater the divisor and the lower the ratio obtained, so that, other things being equal, the road having the highest operating costs would show the best performance in the supply department. The basis of any such comparison should not be money expended, but work performed or service rendered. Perhaps I should not question the manner in which this comparison is made, because the figures which he presents show that the performance of the Wabash Railroad ranks the highest of all the roads between which the comparisons are instituted, but it would be interesting to know why the Chicago Great Western does not appear in the list. Some data obtained from the same source from which Mr. Fritch took his figures, and which was worked out in the manner which he suggests, shows a ratio of 19 for the Chicago Great Western, which would make it a tie with road No. 27 for the twenty-eighth place in the list of 31 roads. Certainly Mr. Fritch has one of his opportunities for economy directly before him. All of this, however, is by the way.

The principal reason why greater advantage has not been taken of this opportunity for economy has been that the managers as a rule are graduates from the operating ranks, and, with some notable exceptions, men of brains and ability with any special training in the handling of supplies on a large scale have not been available for supply department work. This accounts for the retention of the prevalent idea that in order to carry on the work of the railway successfully the procuring and handling of the supplies must be supervised in considerable detail by officers of the transportation, mechanical or maintenance of way departments. Managers who have been convinced that certain economies can be effected by entrusting this work to a separate organization have in many cases established a supply or stores department, but also in many cases they have stopped short of giving the officer in charge of that department the necessary authority which would make him really independent of the supervision of the other branches of the service, and to that extent the opportunity for the greatest possible economy is lost.

The whole training is opposed to the idea that a man who does not participate directly in the use of the material can possibly know how much should properly be carried in stock, or how it can be most economically handled, and they often fear to make the experiment. This is brought out clearly in the article under consideration.

In one line the writer recommends that the stores department should be entirely independent of the operating department, and in the same paragraph he says that the division storekeeper should be responsible to the operating officials as to the disbursement of the stock. This is the operating theory, but it is not good practice; it introduces a divided responsibility at once.

To really get the best results, the supply department must be independent in toto and in reality. Under proper management this can easily be accomplished without taking from the operating officials, who must use the material, any of the choice which they should properly exercise with respect to the kind and quality of material best adapted for the purpose. It would, however, relieve them from the responsibility of deciding how much material should be carried in stock and place that responsibility, together with the more important and difficult duty of always having sufficient material on hand to supply the requirements of the service, upon the individual in charge of the supply department.

A properly organized and really independent supply department will act as a check on a number of the practices indulged in by operating officers and described in the article. The suggested report and the inventories and balance sheets indicated are somewhat crude, and it is evident that the writer is not very familiar with the work of the Railway Storekeepers' Association along this line, and with their published forms of material classification and recommended practices. These represent the last word up to this date in intelligent storekeeping, and have been framed by men who have made a thorough study of the actual working conditions.

The reports which the writer suggests should be made monthly by each department, through the auditor, are inconsistent with his argument for an independent store department. If that was an accomplished fact, none of the other departments would have any reason for making a monthly report touching on material matters, and in my judgment it is not consistent with the best methods to have such reports made through the auditing department unless the divisional accounting system is in effect on the road, in which case, it is not only proper, but desirable, that the division storekeeper's accounts should be handled by the divisional accounting officer; otherwise too many complications are introduced and too many delays encountered in securing the use of the figures to make them of real benefit in the administration of the department.

The thought which seems to run through the article is that operating officers should order the stocks of material and supervise their disbursement, and the supply and purchasing departments should merely supervise the purchasing and handling of the material which the operating officials order. The underlying idea of an independent supply department is contrary to this. The responsibility for having the necessary material on hand when it is needed, and for having no more than is necessary to meet the requirements of the service, should rest entirely upon the general storekeeper, and the operating officials should order from him by requisition only the material that they need for immediate use. While determining the kind and quality of the material which it is desired to use, they should not be permitted to dictate in any way the quantity to be carried in stock, the location of the stock or the methods of its distribution. Until this idea is fully recognized and put into actual practice, under the charge of competent men, the opportunity for economy which exists in this direction cannot be availed of to the fullest extent.

GEORGE G. YEOMANS,
Assistant to the President, Wabash Railroad.

"THE TRUTH ABOUT RAILWAY ACCIDENTS."

Chicago, December 20, 1911.

To the Editor of the Railway Age Gazette:

Relative to the article in the *Railway Age Gazette* of December 8 entitled "The Truth About Railway Accidents," in which you criticise Charles Edward Russell's article entitled "Speed" which appeared in *Hampton-Columbian Magazine* for October, that some of Mr. Russell's statements are "gratuitous guesses" and open to question and that his article, as a whole, is somewhat sensational and misleading, the writer will not attempt to controvert, but will be content with pointing out a few discrepancies in the statistics given in your article. In your first table you give the following statistics:

Railway Accident Statistics, 1908.

Accidents to passengers—	Killed.		Injured.	
	No.	No. per 1,000,000 Pass'r Miles.	No.	No. per 1,000,000 Pass'r Miles.
United States	381	.013	11,556	.40
U. S. Group 2....	80	.011	2,677	.38

In your comparisons there is no division of the roads into groups in any of the other countries, or in any portion of the United States except group 2 notwithstanding that the Interstate Commerce Commission divides the railways of this country into 10 groups. Why is group 2 only singled out? Why not give all statistics of this country by groups so that comparisons could be made? It is well known that the railways which comprise group 2 are, as a whole, the best block-signaled roads in the country, and the mileage in 1908 was about 10 per cent. of the total mileage of the United States. The tables given show the employees of group 2 to be 352,722; employees per one killed, 373; and per one injured, 15. Inasmuch as the number of employees given for group 2 is greater than the total trainmen in the United States it is evident that the total number of employees, which embraces all those employed in the railway's service, were taken to obtain this result, as the number of trainmen in group 2 was 68,898. While group 2, to be exact, had 9.9 per cent. of the mileage in the United States, 21 per cent. of the total passengers killed and 23.17 per cent. of the passengers injured were in that group and of employees, 27.75 per cent. of those killed and 27.67 per cent. of those injured were in that group. Not a very good showing.

The only available defense for the above is to attempt to argue on the basis of "passenger miles" and number of trains. A very large percentage of the excess "passenger miles" in group 2 over the balance of the country consists of a larger number of passengers per train, and to fill a train comfortably full of passengers does not increase the hazard to that train one iota over that of an empty train. Another large factor in this "passenger mile" total is the heavy suburban travel where the cars are crowded. There is only a few miles' travel for each passenger, but it swells the passenger-mile total enormously and the railways of group 2 have far more of this class of travel than any other group. In regard to the number of trains, as above stated, the railways of group 2 are more completely equipped with block signals than those of any other portion of the country, and if visual signals could perform the functions for which they were installed there would be no more hazard with trains in each and every block section than with a less number. It is a self-evident fact, which your article has emphasized to the analytical reader, that the visual signals do not and cannot provide the necessary train protection. Three factors intervene to prevent their doing so, viz., human fallibility, the elements, over which we have no control, and the demands of business for prompt and continuous transportation of both passengers and merchandise.

The question of properly safeguarding trains in this country cannot be solved by drawing comparisons between railway employees here and in England, because the conditions are in no way analogous. As Mr. Acworth aptly puts it in your quotation, "In England or on the continent the railway employee usually spends his entire working life in the service of one company, and to lose his job is a disaster." There is the vital difference, over there that once a servant, always a servant, and the highest ambition that a laborer's son can possibly have is to succeed his father in a position of servitude at a weekly stipend that would hardly keep an American in smoking tobacco. Under such conditions he does become less a man and more an automaton. That condition never can prevail in the United States, and it is idle to discuss it.

The elements—the second factor with which we have to deal—interfere with human vision to such an extent as to render practically impossible the observance of signals, and this interference English roads suffer from fully as much as ours. But in England in cases of severe fogs, all goods (freight) trains are stopped and nothing but passenger trains allowed on the road and the less important of these are sometimes abandoned. Each signal station has a fog pit, an army of fog men is placed in these pits, and the engineman gets his instructions, as to the signal indication from the man in the fog pit. Could our railways follow such a practice? The people would not submit to the delays incident thereto for either passenger or freight, not to mention the expense involved under our American rate of wages.

As this discussion should be confined, as closely as possible, to train accidents we will first consider trainmen, as given in your table. According to the figures given therein it would only take 150 years to kill all the trainmen employed, it is mighty hard to understand how "on the average an employee can work 637 years before being killed." If we take the total number of railway employees, which is unreasonable, as industrial accidents to railway employees have no connection with train accidents, still we are unable to reach the average of "637 years" because, according to the figures given in the tables, it would only take 421 years to kill them all.

Your statement in regard to an automatic stop, "such a device would only prevent collisions," is erroneous. The second annual report of the Block Signal and Train Control Board illustrates, describes and reports on a system of complete automatic control of trains which provides protection against "the inherent defects of the despatching system, the improper working of the block system and the failure of the engineman to observe, understand and obey signal indications." It is true that the report is so much involved as to excuse such oversight by those unfamiliar with the art. The disobedience of signals does not result only in causing collisions; it frequently causes derailments.

Any one familiar with the subject will agree that if all train accidents that are chargeable to the three causes above given were eliminated, there would be very few left, and American railways would be the safest in the world. Now, the modern automatic block signal system, if it were implicitly obeyed at all times, would protect against "the inherent defects of the despatching system" and, if implicitly obeyed, there would be no failure of the engineman, but it could not protect against its own improper working, such as the giving of a false clear indication. The automatic stop properly applied in connection with automatic signals compels implicit obedience, protects against the failure of the signal, and the failure of the man; in short, provides the required protection against accidents incident to train operation. What more is wanted? B. C. Rowell.

[Regarding Mr. Rowell's inquiry as to why we singled out the figures for group 2 for inclusion in the table referred to, that group, in point of population, railway mileage, density of traffic, etc., is more similar to the European countries with whose statistics of railway accidents those of the United States were compared than is the United States as a whole or than any other group or groups in the United States. Mr. Rowell points out that more passengers were killed in proportion to railway mileage in group 2 than in the country as a whole, and says that this is "not a very good showing." He supplies the answer to his own statement, however, by referring to the fact that the density of passenger traffic is greater in group 2 than elsewhere. He

says that "a very large percentage of the excess passenger miles in group 2 over the balance of the country consists of a larger number of passengers per train, and to fill a train completely full of passengers does not increase the hazard to that train one iota over that of an empty train." Certainly not. But where there are the most passengers per train, there will the most passengers be killed in any given number of train accidents.

Mr. Rowell says, "if visual signals could perform the functions for which they were installed, etc." They do this very thing. They are installed to give indications, and they give them. They do not and cannot enforce obedience, but they are not installed to enforce obedience. Visual signals are performing their work in a creditable manner. They are not performing it perfectly, but most collisions on block signalled lines are due, not to signal failures, but to man failures—not to want of correct indications, but to want of obedience to them. An automatic stop would simply enforce the indications given, whether correct or not.

Mr. Rowell dismisses our showing that most railway accidents are due to shortcomings of the human element by saying, in effect, that we shall never have in this country railway employees who will do their duty as automatically as do those of the railways of England. This is saying, in substance, that we shall always continue to have almost as many accidents as we have now, unless the contention of the *Railway Age Gazette,* that no improvement in equipment, whether the installation of an automatic stop or any other, would prevent a great majority of the accidents that now occur, is incorrect. But Mr. Rowell controverts our statement that automatic stops would prevent only collisions. He calls attention to the Block Signal and Train Control Board's description of a system of automatic train control which provides protection against "the inherent defects of the despatching system, the improper working of the block system and the failure of the engineman to observe, understand and obey signal indications." But a system of automatic train control which would do all that is claimed for the one mentioned would do nothing more nor less than prevent collisions. Even if an automatic stop system had been adopted, and had abolished all collisions and derailments, it would have prevented only 785 out of the 10,396 fatalities on the railways of the United States in the year ending June 30, 1911, and only 11,793 out of 150,159 injuries.

Mr. Rowell says "this discussion should be confined as closely as possible to train accidents." Why? Most accidents are not train accidents; and the purpose of discussion should be to reduce all accidents. We contended in the original article on this subject that an automatic stop system would prevent only a small proportion of the total accidents on American railways even if it worked with approximate perfection, and Mr. Rowell's letter does not disprove this. This is not necessarily an argument against automatic stops; but it is a complete answer to arguments for it as a sovereign specific for accidents. Mr. Rowell criticises the statement which we quoted from Mr. Kruttschnitt that a railway employee, on the basis of the figures for 1909, could work 637 years without meeting with a fatal train accident, and says that according to his calculations all the railway employees would be killed in 421 years. It will be noted, however, that Mr. Rowell's calculation is based on the figures for the year 1908, while Mr. Kruttschnitt's calculation was based on the figures for 1909.—EDITOR.]

For the current fiscal year 159,377 tons of steel ties were bought for the Prussian State Railways, 265,771 tons of rails, and 118,822 tons of rail joints, bolts, spikes, etc. The proportion of steel to timber ties has not changed much of late. The prices paid were at the rate of $28.30 for 2,240 lbs. of rails, and $26.60 for ties—each about 50 cents per ton cheaper than the year before. Coal cost $2.86 per ton, which was 1 cent a ton less than the year before. Coal briquettes cost 15 cents per ton more than coal.

THE RAILWAYS' INTEREST IN FOREST FIRE PREVENTION.

BY E. A. STERLING,
Forester, Pennsylvania Railroad.

From the very nature of things, railways are bound to be the initial cause of many forest fires. They have no doubt frequently been held responsible for fires which they did not cause; but whenever forests and woodlands adjoin the right-of-way, sparks from the locomotives may fall in the leaves and litter during dry weather and start a fire. Spark arresters, which are intended to break up the live cinders and reduce their temperature below the combustion point, are almost universally used; but the fact remains that live cinders do reach the ground, and it appears that an arrester which will effectively stop sparks will also retard the draft. While most roads have been reluctant to admit this, the evidence seems to be against them. Rather strong proof of the danger from sparks thrown by coal-burning locomotives was furnished in New York state in 1903, when practically the whole Adirondack region adjacent to the railways, except along a branch to Raquette lake, where oil-burning engines were used, was burned over, and fires started behind nearly every day

Area Burned Along Both Sides of Track Where Railway Failed to Provide Fire Line.

train. A map of the burned district showed a broad fire-swept belt paralleling all the railways.

In addition to the fires which may be traced to sparks from locomotives, the very existence of a railway in a forest gives rise to fires which result from indirect causes for which the railways should not be held responsible. Passengers often throw burning cigars or other ignited material out of the car windows; while the great army of the unemployed and unwashed which moves constantly along the lines starts many forest fires through carelessness and indifference.

Whatever may be the cause of the many fires which originate on or near railway right-of-way, the attitude of the public, and even of the state and government officials, who should know better, has generally been unfair to the roads. It has been customary to picture the railways as forest-destroying monsters, roaring up and down the tracks, with grim satisfaction in the damage done. Scant consideration has been given the fact that it takes time and money to keep a right-of-way even reasonably clear of inflammable material, and that even if this is done, fires may start on private land outside the right-of-way, where the road has no power to prevent the accumulation of inflammable debris, yet is held responsible for damages. As a fundamental fire preventive measure, the best mechanical engineers in the country have been sparing no pains and expense to perfect spark

arresters which would be effective and practical. In some forested regions the states have been more remiss than the railways in having failed to provide adequate means or organization to cope with the fire danger; yet have blamed the railways for much of the damage without shouldering their own share of the burden. A more enlightened viewpoint is now being accepted.

As to a motive, or even an excuse, for indifference on the part of the railways, there is none, because they are often the heaviest losers in case of fire. They are, first of all, the constant prey of scheming land owners who place the liability on the railway and attempt to collect damages for every fire, no matter how it starts. An authentic story is told of a railway section gang going a quarter of a mile across the fields and helping a farmer put out a fire in his woodlot. A few days later, the company received a bill for the damage done. If an honest land owner gets damages for a fire, every man in the region whose conscience is a little rusty will promptly have a fire and start a damage suit.

The railways simply could not afford to be indifferent to the destruction of forest property by fire, as both passenger and freight business would suffer. Burn over a summer resort region like Maine or the Adirondacks, and the heavy passenger traffic would vanish with the forests. Timber and lumber in many forms constitute a large percentage of the freight tonnage on many roads. Railway extension in the Pacific Northwest is usually credited to agricultural development; but, despite the large output of grain, stock, fruit, and other products, fully 75 per cent. of all eastbound rail freight originating west of the Cascades, and 80 per cent. of the freight handled at Puget Sound ports, is composed of forest products. Not only do the railways derive a large revenue from the forests, but they are among the largest users of forest products. Exhaust the timber resources of a region, and the additional cost of cross-ties, posts, lumber, etc., very materially increases the maintenance charges.

As the railways cannot afford to add to the fire menace in the forested regions through which they operate, they should also be active in the prevention and suppression of fires. Unfortunately, they have been so only within the past few years. The conservation and development of local industries and resources has characterized the broad-gage management of most roads; but through lack of education on the subject, or failure to appreciate the importance of forest products as a source of tonnage and of the forests as a resource and asset, an effective policy regarding forest fires was of slow development. In the South Atlantic states, for example, we find the railways working constantly for agricultural development, while overlooking the fact that the large percentage of the land which is unsuited for farming would naturally reforest itself if fires were prevented, and constitute a permanent source of revenue. A railway company is a long-lived corporation, which can look far into the future and afford to wait a reasonable time for returns.

The active fire preventive work undertaken by roads falls under the three heads of compulsory, co-operative and voluntary.

Railway Fire Line in New Jersey.

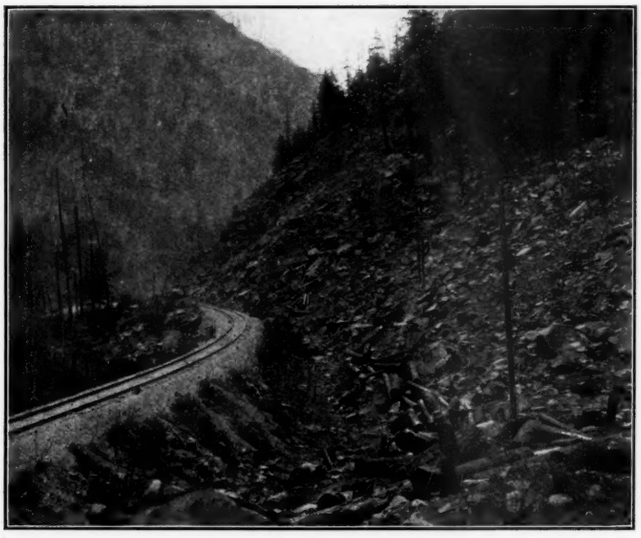
Ten-foot strip, with soil exposed, 100 ft. from outer rail; intervening space cleared of undergrowth, with trees acting as fire screen.

In New York state an example of compulsory action is legislation enforced by the Public Service Commission, requiring all railways which traverse the Adirondack region to use oil-burning locomotives during the day time from April 15 to November 1. The same roads are also required to maintain a patrol during the summer, which they have attempted to do with varying degrees of success. Prior to the enactment of this law, some of the roads voluntarily maintained a patrol, provided water barrels at dangerous points, and operated special waste tank cars equipped with pumps for extinguishing fires set on the right-of-way. The voluntary work was not entirely effective, so the state has secured practical immunity from railway fires by putting a heavy burden on the roads. Oil as fuel in this region costs 30 to 50 per cent. more than coal. On the Chateaugay branch of the Delaware & Hudson, it costs about 10 cents per train mile

more to burn oil than coal, aside from the costs of changing the locomotive furnaces twice a year. It is probable that closer voluntary co-operation between the railways and the state would have saved expense and trouble.

In Massachusetts and New Jersey, the law permits the railways to make, at their own expense, protective clearings or fire lines outside of the right-of-way, without liability of trespass. In New Jersey, the law (Chapter 74, Laws of 1909) is very specific, and provides that the roads shall, within a stated time, construct through all forested land a safety belt 10 ft. wide, 100 ft. from the outer rail, and between this belt and the track cut out thick brush, trim the large trees to a height of 6 ft., and clear away all inflammable material. Up to January 1, 1912, about 235 miles of fire breaks had been built in accordance with the law. Although the Forest Commission was enjoined from enforcing the law, pending decision as to its constitutionality, most of the roads in the state continued the work because of its practical value in preventing fire and reducing liability. The authority given to remove debris and construct fire breaks on adjacent land, even though it is done at their own expense, gives the roads a freedom from damage suits which does not exist when such laws are not in effect. The New Jersey law, while originally a compulsory one, is working out on a co-operative basis. The cost of these fire lines varies from $125 to $500 per mile, with an average of about $180.

A comparatively new legislative feature affecting the railways is found in the new Minnesota law, which provides that "when, in the judgment of the state forester, there is danger of the setting and spreading of fires from locomotive engines, he shall order any railway company to provide patrolmen to follow each train throughout such fire patrol district or districts as he deems necessary to prevent fires." The same act also provides that the railways, independently of the state forester, shall patrol their right-of-way and take other steps to prevent the setting and spreading of fires. This last provision is similar to the New York state law, except that the latter permits the state to organize a patrol and charge the cost to the railways in case an adequate railway patrol is not provided. Just how a patrol system which is based largely on the judgment of a state official will work out remains to be seen, but it promises well if the states and the railways will work in harmony. In August of this year, State Forester Cox of Minnesota stated that "the railways have been brought to realize that a business-like system of fire protection is a paying proposition, and they have organized special forces of patrolmen on speeders and placed them where the district rangers feel that they will be most effective. The companies are also paying more attention than formerly to the question of spark arresters on their locomotives."

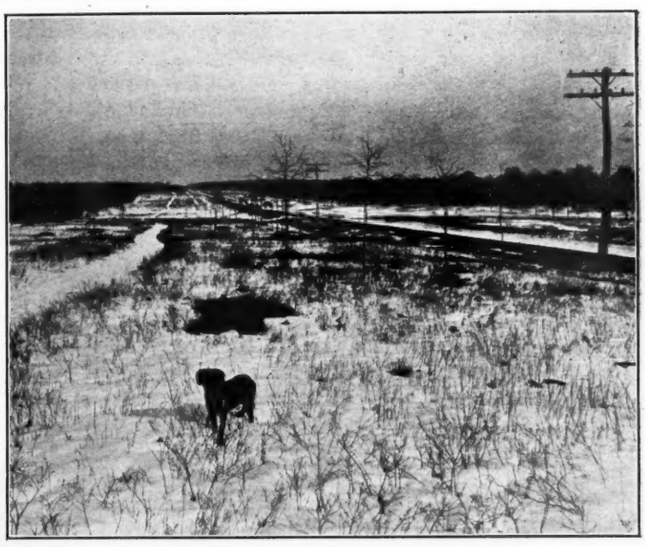


Turnwater Canyon, Near Wenatchee, Wash., on the Great Northern.

Clearing shown on right side of track.

It is believed that, under ordinary conditions, the best results will come from mutual co-operation between the railways and those interested in forest protection, and a combination of state and private patrol, which can be made more effective by keeping the right-of-way and adjacent land clear and by using improved spark arresters. A club, particularly a legal one, is usually not a welcome nor an effective incentive to good behavior. Where mutual interests are involved, all action taken by the responsible parties should be closely co-ordinated.

During the last year the state forester of Wisconsin called a meeting of railway officials, timberland owners and others, and together they discussed ways and means of curbing the fire evil. Fifteen railways were represented by prominent officials, and they all seemed awake to the seriousness of the problem and anxious to help in its solution. The railway representatives present agreed unanimously on the following measures, which they believed would practically eliminate fires from locomotives:



Railway Fire Line Through Pine Land in New Jersey; Tree Growth Entirely Cleared.

1. That the right-of-way be cleared of all combustible material under the direction of the fire wardens.
2. That the burning of debris on the right-of-way be controlled by the fire wardens.
3. That under special conditions there be a regular patrol, properly equipped with fire-fighting apparatus, following each train.
4. That all freight train crews keep a lookout from the top of the caboose, and that they be required to stop and put out fires when discovered.
5. That some means be devised to keep a strip 100 ft. wide adjacent to the right-of-way free from slashings.
6. That there be as much improvement as possible in the mechanical construction of locomotives.

Some of the co-operative and voluntary measures which are being carried out give promise of the ultimate solution of the railway forest fire problem. In the timbered belts of western Washington, two transcontinental lines are installing oil-burning locomotives; while the Great Northern has signified its intention of using Radley Hunter stacks on coal-burning engines on branch lines. The automatic self-dumping ash pan which the government has compelled some of the western railways to adopt, at heavy expense, has proved a prolific cause of fire. The Chicago & Northwestern, however, is overcoming this danger by equipping its locomotives with water jets to extinguish the live coals.

In Canada, the Canadian Pacific, which for years has been

active in developing the country's resources, now has a forestry department to look after the enormous areas of forest land along the lines of the railway. The company owns large tracts of forest land, and in connection with the definite system of forest management is giving particular attention to the work of forest protection.

Throughout the Northwest, protective forest fire associations made up of timberland owners are doing wonderfully effective work by education, patrol and mutual co-operation. During 1911 the Western Forestry and Conservation Association, through its affiliated associations, for which the parent organization acts as a clearing house, patrolled sixteen million acres of land containing four hundred billion feet of timber, and spent over $207,000 in fighting fire and maintaining 1,400 patrolmen. The protective fire associations throughout the country protect in the neighborhood of thirty million acres of timberland, and not a small part of their work is co-operation with and through the railways. The timberland-owning railways of the West contribute directly to the maintenance of the associations, the Northern Pacific during 1911 paying over $14,000 through assessments. As the fire interests of the timberland owners are closely allied with the forest service, the states, and the railways, we now find these four interests working in close harmony, and with excellent results.

The forest service, with nearly two hundred million acres of national forests, or an area seven times as large as the state of Pennsylvania, under its control, has the heaviest fire responsibility of any single organization. The existence of some 2,000 miles of railway in these forests calls for a definite system of fire protection, which involves both legal and co-operative arrangements. The federal act of March 3, 1875, contains certain stipulations under which right-of-way can be secured through public land. Grants or easements for any right-of-way crossing government land are issued by the secretary of the interior, but if national forest lands are involved they must be passed upon by the secretary of agriculture; and, as conditions vary greatly in different regions, the terms of the stipulations are modified to meet local conditions.

When the Chicago, Milwaukee & Puget Sound road was put through to the Pacific coast, the railway made a very thorough clearing on strips adjacent to the track on government forest land, but not upon patented lands within the national forest boundaries. When the Soo line was constructed across the Minnesota national forest, the railway plowed a strip of land 25 ft. wide, the inner edge of which was 100 ft. from the track, along both sides of the right-of-way throughout its entire length across the forest, except where natural fire barriers existed. The Spokane International, in building across the Pend Oreille national forest in Idaho, executed a supplementary agreement under which the railway maintains, during dry seasons, a patrol of the right-of-way in conjunction with the forest service patrol. Usually, however, the forest service maintains its own patrol along the railways, this being generally considered more effective, because it can be correlated with the patrol of adjacent areas.

It is illustrative of the present attitude of the railways that practically throughout the west they have been willing to go farther than the law requires in co-operating with the forest service for the reduction of fire losses. They have established voluntary patrols, furnished special trains for fire-fighting crews, taken their own men from construction or maintenance work to assist in fire fighting, and put on oil-burning locomotives through forested regions. The Chicago, Milwaukee & Puget Sound people were the first to test out oil burners thoroughly and to introduce them generally on divisions crossing the national forests.

The Great Northern and the Northern Pacific secured their right-of-way prior to the creation of the national forests; but notwithstanding the absence of legal necessity for action, they entered into co-operation of a very significant and assuring character. In April, 1910, these two roads made identical agreements with the United States Department of Agriculture, under which, very briefly summarized, they agree to clear and keep free of inflammable material the right-of-way and a strip of adjacent land not over 200 ft. wide; equip all locomotives so as to prevent the escape of sparks and fire as far as practicable; establish an effective system of reporting fires on or near the right-of-way; give the use of company poles for forest service telephone and telegraph lines; grant permission to forest officers to operate speeders on company tracks in connection with patrol; take all possible action towards the prompt extinguishment of any fire discovered by railway employees; and reimburse the forest service for extra labor in extinguishing fires which start within 200 ft. of the tracks. The forest service, representing the Department of Agriculture, in return patrols the railway right-of-way during the fire season; furnishes, without expense, the services of available forest service employees for fighting fires on or near the right-of-way; pays for extra labor hired by the railway in extinguishing fires which started more than 200 ft. from the track; supervises the clearing of the company's right-of-way and adjacent land; constructs telephone lines to connect the headquarters of the forest officers with points on the railway; stores at convenient points sufficient tool equipment for successful fire fighting; and requires its employees to report immediately to the nearest agent of the company any defect discovered in the track or roadbed which might constitute a menace to safety.

In addition to the formal agreements, many informal arrangements are in effect between local forest service officials and the railways. One of the encouraging features of all of these agreements is the remarkable absence of friction in carrying out the details, the importance of the work and the necessity for co-operation being so apparent that all the interests are more than willing to do their share.

W. B. Greeley, assistant forester of the forest service, who is thoroughly familiar with field conditions in the national forests of the west, sums up the railway situation by saying: "I think it is safe to say that the progress in co-operation along these various lines with the railway companies made during the past three years is one of the most significant and effective things that have ever been done towards reducing the fire danger in the heavily-timbered portions of the west."

The fire conferences, which have become annual affairs and national in scope, are representative of the spirit with which forest fire problems are now being approached. At these conferences unproductive generalizations and spread-eagle speeches on our terrible fire losses are eliminated, and the lumbermen, railway men, and forest officials present get down to practical details of fire prevention and control. R. H. Aishton, vice-president of the Chicago & North Western, made one of the principal addresses at the St. Paul conference in December, 1910. He pointed out that in the three states of Michigan, Wisconsin and Minnesota, there are 7,800,000 acres of forest land, traversed by 7,500 miles of railway, excluding sidings, logging roads, etc. On these roads there are operated daily nearly 600 passenger trains and 940 freight trains, requiring 1,800 locomotives. The interests of the railways and of the states are closely related, and the railways more than any other interest appreciate the importance of conserving the forests and other resources. Mr. Aishton mentioned the specific things the railways are doing to prevent forest fires, and asks what further they can do. He sums up their attitude by saying:

They believe that the protection of the forests now conserves the revenues of the railways in the future, and to many of the railways it means their future life and prosperity.

They believe that the protection of the forests may be bettered by more efficient control by the officers of the states over all the interests engaged in business in the timber areas.

They believe in taxation that will enable a well-trained and efficient force to be organized and maintained in each state and endowed with police powers for the protection of the forests.

They believe the interests are so great and so identical that

settlers, lumbermen, manufacturers, and railways and every other interest should unite in a plan to which all can work; which would be harmful to no interest and which would be beneficial to all.

Some of the recommendations passed at the St. Paul conference would have seemed very radical a few years ago, but now appear as belated means of attaining a much desired end. The resolution adopted concerning railways was: "That the burning of all debris on the rights-of-way of the various railways be under the control and direction of the state forester. Further, that under special conditions, as directed by the state forester, the railway companies maintain a patrol, properly equipped, following their trains; also, that all railway and logging locomotives and traction engines must be equipped with the most practical arresting devices (subject to inspection and approval of the commission)."

At Portland, Ore., in December, 1911, another fire conference was held under the auspices of the Western Forestry and Conservation Association. The western railways took an important part in the discussions. E. W. Osborne, of St. Paul, representing the Northern Pacific, stated that the use of oil-burning locomotives would impose a hardship on coal mining towns which depend for their support upon the sale of coal to railways. F. A. Silcox, United States district forester, spoke on railway fires, and showed that while American railways cause many fires, European roads seldom cause fires, because of the compulsory use of safety devices and the clearing and patrolling of the right-of-way. A novel educational feature of the western fire preventive campaign is the publication of fire association notices in the railway folders and pamphlets. The resolutions adopted regarding railway co-operation were essentially the same as those given in another part of this article as the recommendations of the Wisconsin conference. The preamble, however, is worthy of being quoted, as illustrating the importance of the forests to many interests. It reads:

"*Whereas,* The protection of the timber resources means the stumpage value to the timber owner of approximately $2.00 per M feet B. M., employment and remuneration to the wage earner of approximately $8.00, tonnage to the railways both in supplies, equipment, and forest products approximately $6.00 to $8.00 per M, benefits to the farmer and merchant through the use of supplies, an insurance of community prosperity and the general public welfare; and

"*Whereas,* It is recognized that the railways operating in forested regions are a source of fire danger, menacing the preservation of this resource for use; and

"*Whereas,* The danger from forest fires is common to all and co-operation is necessary to meet this danger; now, therefore, be it resolved, etc."

The forest fire problem will not be solved in a day, nor a year, nor by any one influence; its solution will come only by concerted action on the part of the interests most vitally affected, and they can achieve the desired ends most quickly if supported by public sentiment and helpful legislation. A summing up of the measures which the railway companies could logically and profitably put into effect as their part in the work would be as follows:

First. Voluntary action to remove causes of complaint and reduce fire liability. A clear right-of-way, efficient and carefully-inspected spark arresters, and patrol under conditions and in seasons which require it, would go far towards removing prejudice and keeping the railways' forest fire record clean.

Second. Co-operation with state and government officials and private land owners in preventing and controlling fires. This would include prompt reporting of fires by trainmen and other employees, assistance in fighting fires, and an understanding and co-operation in applying preventive measures.

Third. An educational campaign among employees and local residents, covering the danger and loss from forest fires and methods by which they can be controlled.

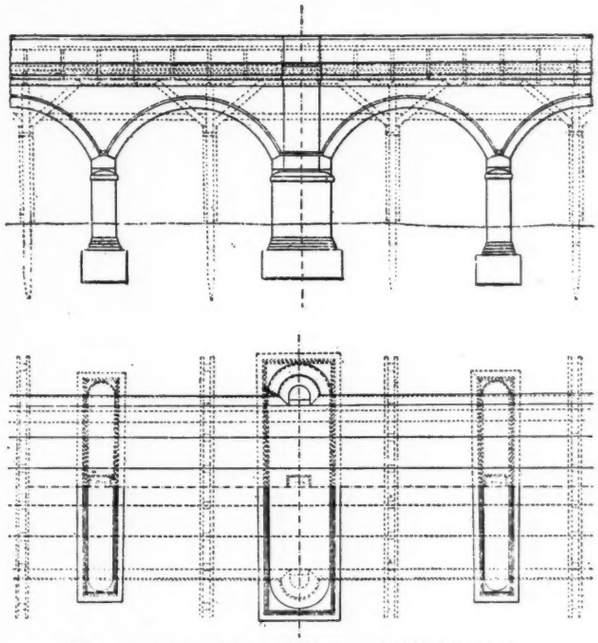
Fourth. Assistance, in so far as it can properly be rendered, in procuring helpful legislation and more liberal state and federal appropriations for forest protection.

NEW RADCLIFFE VIADUCT ON GREAT NORTHERN OF ENGLAND.

BY C. VAN LANGENDONCK.

During the past two years, the Radcliffe viaduct, on the Great Northern Railway of England, which was originally of timber, has been entirely rebuilt of brick. The total length of the viaduct, including a bridge over the River Trent, is 1,254 ft. It consists of 28 spans, eighteen of 24 ft. 11 in., and ten of 25 ft. 7 in. A double abutment on a bank in the center separates the 18 spans from the ten. The 18 spans are divided into three sets and the ten spans into two sets by stop piers 10 ft. wide, the intermediate piers being 4 ft. 1½ in. wide. The arches are five courses in thickness and are covered with blue brick paving. Cutwaters of brickwork were formed at each end of the piers, as the floods from the river run in both directions from the bridge. Manholes have been provided on the stop piers, and large circular recesses on the central bank for look-out men in times of flood.

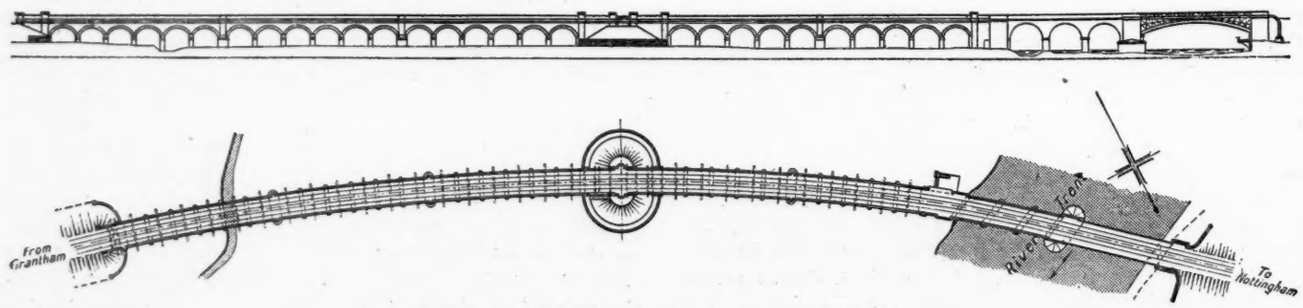
The foundations of the piers average 10 ft. in depth, going through a bed of gravel to a bed of marl. As considerable difficulty was experienced at times with water in the foundations, which at the normal level of the river rose through the gravel to within an average of 6 ft. from the surface of the ground, the concrete in the foundations was made with six parts of broken slag and gravel obtained during the progress of the work and one part of cement. The viaduct was built of local bricks faced with Staffordshire brindled bricks, with cement mortar of one part cement to three of sand. The three stop piers were first built up to the springing line of the arches. A trestle was then fixed upon each of them up to the stringers of the old viaduct, and securely wedged to them, thus dividing the old structure into five parts, so as to minimize the risk during reconstruction. The work was then dealt with in sections between the stop piers. The intermediate piers were carried up to springing line and the centers fixed. As these had to be built between the timbers of the existing viaduct, it was necessary to erect each one in pieces in place. The lagging was then fixed for about 4 ft. on each side of the piers, and the piers built above the springing line, about 4 ft. of the arch being turned on each side. Trestles were then fixed on the top of each pier in a manner similar to that on the stop piers. The struts from the piles



Plan and Elevation of New and Old Viaducts.

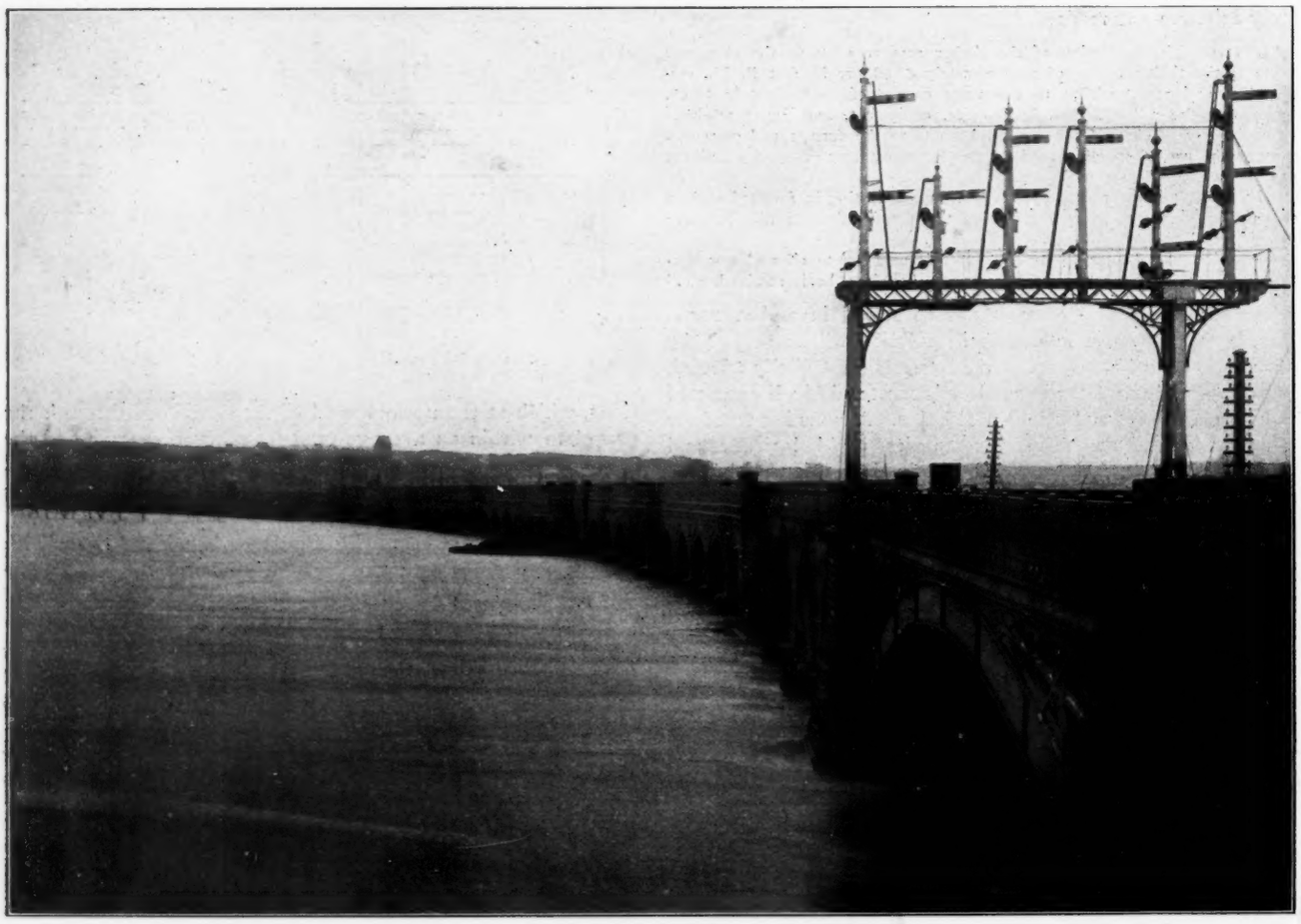
of the old viaduct parallel to the center line of track were then taken out and temporary struts fixed in the opposite direction connecting the trestles on the new brick piers to the stringers. This enabled the lagging to be put on over the rest of the centers, the only portion of the old viaduct coming through the lagging being the piles. The arches were then turned in the usual way, with the piles passing through them. As soon as the haunches were filled up and sufficiently set to bear the weight, the whole was paved with blue bricks, packings were then put under the stringers to bring the weight on the arches. The tops of the piles were sawed off underneath and withdrawn from the brick work, the holes they had occupied being filled up.

The parapets having been built, it was necessary to arrange to take out the old stringers, caps and struts, and the planking of the floor from the top of the arches, and to fill the space they occupied up to subgrade. As one track had to be kept open for traffic, it was necessary to arrange to fill half of the viaduct at one operation. A dry rubble stone wall was therefore built between tracks nearly up to the planking of the old viaduct. Holes were cut in the planking, and as much filling of rubble stone and worn out ballast as possible was unloaded, care being taken not to cover the old timbers so that they could not be readily removed. When this was completed one track was abandoned for traffic on a Sunday, the old timbers were taken out, and the remaining space filled up. The bottom ballast of broken slag was then laid and the new track laid in place.



Plan and Elevation of New Radcliffe Viaduct.

The operations of taking out the old structure and filling up the arches, and laying in the new track occupied six Sundays. With these exceptions, traffic was not stopped over the viaduct during the period the work was in hand, beyond permanently reducing speed to 5 miles per hour, so that sufficient control might be retained over trains in case of accident. It was not found necessary to bring any train to a standstill during the progress of the work.

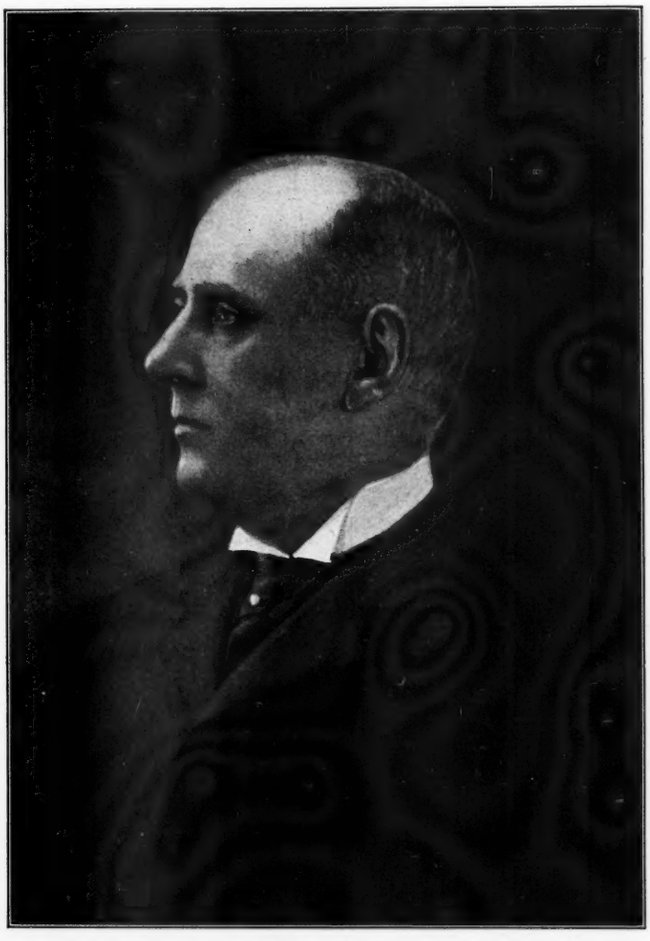


New Radcliffe Viaduct, During Flood.

EDWIN HAWLEY.

Edwin Hawley, who died from a sudden attack of heart failure at his home in New York on February 1, has been connected with railway business for about 45 years, first as a traffic man and later as a financier. As a traffic man he was in the service of the Southern Pacific and was an associate of Collis P. Huntington; as a financier he negotiated the sale of the Huntington holdings of Southern Pacific to E. H. Harriman for the Union Pacific, gained control of the original group of Hawley roads—the Toledo, St. Louis & Western, the Chicago & Alton, the Minneapolis & St. Louis and the Iowa Central—and, associated with Frank Trumbull, had a considerable financial interest in the Colorado & Southern, which was sold to the Chicago, Burlington & Quincy in 1907.

It was after the sale of the Colorado & Southern in 1907 that one began to hear a good deal about Mr. Hawley's plans for a system of roads, which plans were sometimes compared with Mr. Harriman's plans for a Harriman system. This, however, is not an accurate comparison. Mr. Hawley and Mr. Trumbull, after selling their control of Colorado & Southern, bought from Kuhn, Loeb & Company control of the Chesapeake & Ohio, and Mr. Hawley negotiated the purchase of the Chicago, Cincinnati & Louisville for the Chesapeake & Ohio shortly after Mr. Trumbull negotiated for the purchase of the control of the Hocking Valley and a joint interest in the Kanawha & Michigan for the Chesapeake & Ohio. Shortly after this Mr. Hawley and two associates gained control of the Missouri, Kansas & Texas, and quite recently Mr. Hawley, associated with Newman Erb, announced plans for extending the two roads which they had just merged—the Minneapolis & St. Louis and the Iowa Central—to the Canadian border on the north, and connecting them with the Missouri, Kansas & Texas on the south. These later plans of a north and south system are more nearly comparable with the railway planning of E. H. Harriman than any of the financial schemes that Mr. Hawley carried out.



Edwin Hawley.

Mr. Hawley was a shrewd financier rather than a constructive railway owner. Of the properties with which the Hawley name has been associated, the two which have been managed with real success as railways are the Colorado & Southern and the Chesapeake & Ohio, and while Mr. Hawley had a considerable financial interest in both, the success of their management was due to Frank Trumbull, who was both financially interested in them and directly in charge of them.

The properties which may fairly be called Hawley properties, such as the Alton, the Clover Leaf, the Minneapolis & St. Louis and the Iowa Central, were not conspicuously well managed from a railway man's point of view. It was as a speculative banker that Mr. Hawley earned the position in both the railway world and the financial world which he occupied at the time of his death. Mr. Hawley was the senior member of Hawley & Davis, was a member of the New York Stock Exchange, although he had not been active on the Exchange for a number of years, and, as the recognized head of a certain group of capitalists, which included Theodore P. Shonts and some of the old Southern Pacific people, had a very important influence in the railway situation of the country.

He was born in Chatham, N. Y., in 1849, and began railway work as a clerk in the Erie freight office in New York in 1867. In 1870 he became a clerk in the offices maintained at New York by what was known as the Rock Island Route. In 1874 he was made contracting agent, and, in the following year, general eastern agent of the California Fast Freight Line. His connection with the Southern Pacific was begun in 1883, when he was made general eastern agent of the Galveston, Harrisburg & San Antonio and the Southern Pacific Company. Two years later he was made also general eastern agent of Morgan's Louisiana & Texas Railroad & Steamship Company, the Louisiana Western, the Texas & New Orleans, the Houston & Texas Central and the Mexican International. From March, 1890, to February, 1902, Mr. Hawley was assistant general traffic manager of the Southern Pacific, with office at New York. He had been president of the Minneapolis & St. Louis since 1896.

Mr. Hawley was unmarried. He was a silent and extraordinarily persistent worker. He had the reputation of being rather slow in his judgment, but was actually a careful man rather than a slow thinker. He was capable of making the most important decisions quickly and finally. His purchase for instance, into the Chesapeake & Ohio was decided on after a single short inspection trip over the property. A close friend of the late Edwin Hawley said that the will made in 1903 was subsequently destroyed and that it was Mr. Hawley's intention ultimately to have all his interests incorporated. It will be recalled that Mark Twain adopted this method of disposing of his property. It was also said that Mr. Hawley was prevented from carrying out his plan by his unexpected death.

The Belgian State Railways in the first 11 months of 1911 earned 6½ per cent. more from freight, but 6 per cent. less from passengers than in 1910, when the exposition in Brussels caused abnormal travel. There was a large increase in the movement of coal and iron ore. Although Belgium has important coal mines, last year it imported more coal than it exported. Its coal mines, apparently are being worked out, and their owners claim that their receipts per ton on the average are not more than 10 cents more than their expenses. The government has announced that it will advance rates on coal in February, and perhaps their estimate was affected by that announcement.

JOINT CAR INTERCHANGE BUREAU AT CHICAGO.

An exceedingly interesting experiment with a plan designed to improve and facilitate the interchange and reporting of cars at large terminal centers has been worked out in the Union Stock Yards district at Chicago during the past year and a half with such successful results that it is now proposed to extend its operation to other parts of the city.

In June, 1909, at the request of the American Railway Association, a joint committee of the Master Car Builders' Association and the Association of Transportation and Car Accounting Officers was appointed to investigate and report on conditions of car interchange and methods of reporting cars interchanged throughout the country. At a meeting of this joint committee on January 26, 1910, at Chicago, it was decided to make a practical test to ascertain whether a system could be devised to improve the accuracy of such reports, and to endeavor to ascertain what, if any, modifications should be made in the M. C. B. rules which would tend to expedite the movement of cars while conserving the safety of operation.

The joint Committee on Joint Interchange and Inspection Bureaus is composed of the following members: Master Car Builders' Association: J. J. Hennessey, chairman, Chicago, Milwaukee & St. Paul, Milwaukee, Wis.; T. W. Demarest, Pennsylvania Lines, Fort Wayne, Ind.; E. D. Bronner, Michigan Central, Detroit, Mich.; W. A. Nettleton, Chicago, Rock Island & Pacific, Chicago; J. S. Lentz, Lehigh Valley, South Bethlehem, Pa., and Joseph W. Taylor, secretary, Chicago. Association of Transportation and Car Accounting Officers: C. B. Strohm, chairman, Atchison, Topeka & Santa Fe, Chicago; J. R. Kearney, Baltimore & Ohio, Baltimore, Md.; W. T. Aylesbury, Terminal Railroad Association, St. Louis, Mo.; E. E. Betts, Chicago & North Western, Chicago; R. R. Harris, Cleveland, Cincinnati, Chicago & St. Louis, Indianapolis, Ind., and G. P. Conard, secretary, New York.

In view of Chicago's position as a railway center, where more cars are interchanged every 24 hours than at any other city in the world—approximately 14,000 a day—it was decided to make the test in Chicago, and the Union Stock Yards district was selected as the place to be covered by the trial. At the request of the Committee on Joint Interchange and Inspection Bureaus, the Joint Car Inspection and Interchange Bureau was established on July 1, 1910, with headquarters at the stock yards, under the auspices of the General Superintendents' Association of Chicago, to conduct a practical demonstration of the bureau plan of joint inspection and reporting. This bureau has now demonstrated the possibility of such an increase in efficiency that it was decided to extend the scope of the plan as far as possible to cover the entire city. For this purpose the Chicago Car Interchange Bureau was organized on January 1, 1912, with offices at 603 Grand Central Station.

Some of the features of the plan, as worked out by the stock yards bureau, with a history of the development of car interchange practice which led to the formation of the committtee, were described by T. W. Demarest, superintendent of motive power of the Pennsylvania Lines, in a paper presented before the Western Railway Club on February 21, 1911, of which an abstract was published in the *Railway Age Gazette* of March 3, 1911, page 414.

The essential feature was the combination of the mechanical inspection and carding of the physical condition of the cars at interchange points with the obtaining of records required by the transportation department. The work was done by inspectors employed by and reporting to the bureau direct instead of to the individual roads, and the reports were rendered to the roads by the bureau.

With the formation of the Chicago Car Interchange Bureau on January 1, the city has been divided into eight districts, of which the Union Stock Yards district, formerly covered by the Joint Car Inspection and Interchange Bureau, is one, and the work of that bureau has been transferred to the central bureau. While for the present no attempt has been made to apply at once to the entire city the entire system used in the stock yards district, it has been decided to establish joint supervision throughout the Chicago switching district by April 1, and it is the hope of those who have been most instrumental in the working out of the plans that ultimately interchange throughout the city will be reported through the bureau. In the meantime the extension will be a matter of gradual development, being carried forward as fast as the bureau is able to apply the joint methods to the districts found most adapted to the change, while gradually effecting improvements in present methods to pave the way for its introduction as a whole.

The bureau is in charge of a chief interchange inspector, F. C. Schultz, formerly chief car inspector of the Chicago, Burlington & Quincy at Chicago, who reports to an interchange committee of the General Superintendents' Association, of which Mr. Demarest is chairman. Reporting to Mr. Schultz are eight assistant chief

Form 152. Sheet No.....

DAILY INTERCHANGE REPORT OF CARS.

From.....R. R. to.....R. R. at Union Stock Yards, CHICAGO Station.

From 12:01 A. M. to 11:59 P. M.,.....191

Sheet No..... | INSPECTOR'S NAME. ..... | Sheet No. .....

Marks. 1	Kind. 2	Number. Loaded. 3	Number. Empty. 4	Check.	Hour Delivered 5	Point of Shipment. 6	Final Destination. 7	Contents. 8	Seals. Right Side. 9	Seals. Left Side. 10	Physical Condition. 11

I certify that these cars were interchanged as above.

F. C. SCHULTZ,
Chief Interchange Inspector,
600 Grand Central Station.

THE CHICAGO CAR INTERCHANGE BUREAU,
Chicago, Illinois.

Form Used by Bureau in Reporting Cars Interchanged.

inspectors, one for each district. Charles Bossert, the assistant for the stock yards district, has been the chief interchange inspector of the original joint bureau at the yards.

Under the former system three different men, or sets of men, were required to obtain the reports of an interchange movement, one to inspect the physical condition of the car for the mechanical department, another to obtain the data required by the car accountant's office, and a seal clerk to inspect the condition and record the numbers of the car seals. Some of these men performed other work, and they were also under the supervision of men charged with other and varied duties. At important interchange points in many cases each road was compelled to maintain its own inspector, although the work required of him might, and often did, take but a portion of his time. While the mechanical department inspector had the right to flag a cut of freight cars while inspecting it, in order to prevent its being moved while he was at work about the cars, the transportation department inspectors often were obliged to obtain their records while the cars were moving, and, as a consequence, the car accountant frequently found a car on his lines without a record of the time when it was received. This condition, requiring expensive and tedious tracing, led to the experiment of giving the transportation department the advantage of the more complete records kept by the mechanical department; and one of the primary features of the joint bureau plan of inspection was the placing of the point where the Chicago Junction delivers to 28 roads, 39 inspectors were formerly required, whereas now but 22 are required, and they take additional data.

The usual practice is for the inspectors to work in pairs, one taking one side of the car or cut of cars, and his partner taking the other side. The inspector who does the bookkeeping, on entering the initials, number, etc., from the car, calls them from his record to his partner on the other side, who replies as to whether or not the recorded data checks with his side. In a few cases inspectors work singly, inspecting one side of a car or cut of cars and returning along the other side to complete the inspection. At the beginning of his examination he records the car initials, number, etc., and in returning on the other side checks the initials and number with his record. In this way any errors are detected at once and corrected. In one case three inspectors constitute a team, one on each side of the cars and the third doing the bookkeeping, but whether the inspection is done by inspectors working singly or in teams of two or three, each car is carefully examined on both sides, and while the cars are standing rather than when they are in motion.

Inspectors at the stock yards are authorized to apply M. C. B. defect cards, in accordance with the M. C. B. rules, at the time of the interchange, and beginning April 1 inspectors will also do so elsewhere throughout the city. In the stock yards district it has been found that about 5 per cent. of the cars interchanged

Form 151.

THE CHICAGO CAR INTERCHANGE BUREAU
CHICAGO, ILLINOIS

From .....Ry. to .....Ry.

INSPECTOR'S NAME.	Sheet No.	MONTH.	DAY.	YEAR.
.....	.....	.....	.....	191....

INITIALS.	Kind.	NUMBER. Loaded.	NUMBER. Empty.	Hour interchanged.	Destination or Consignee.	Contents.	SEALS. Right Door.	SEALS. Left Door.	CONDITION OF CAR.

In "Kind" of Car column use B for Box. S Stock. C Coal. F Flat. R Refrigerator. T Tank. Fn. Furniture.

Inspector's Report Sheet.

record taking for both the mechanical and transportation departments in the hands of the mechanical department inspector.

Considerable objection was voiced at first by the mechanical department officers against adding to the work of their inspectors the duty of obtaining records for the transportation department also. This objection is still made in some quarters, although it has been very largely overcome as the plan has demonstrated its advantage. Where the bureau plan has been adopted the expense has been pro-rated between the mechanical and transportation departments as well as between the roads involved.

The record taken by the stock yards bureau, besides covering the usual mechanical inspection required under the M. C. B. rules and the application to the cars of the M. C. B. defect cards when due under the rules, includes a record of the seals, contents of the car, point of shipment, destination and time of interchange; and the work done by the bureau includes settlements with private car owners whose cars are at home in the stock yards for damage to their equipment, and the preparation of the daily interchange reports, comprising data required by the car accountants, master mechanics and agents.

All inspectors for the stock yards district are hired by and are responsible only to the bureau instead of to the individual railways. This makes possible a reduction in the number of inspectors required, and also obviates any chance for a disagreement between the inspectors of the delivering and receiving roads, as the record of the bureau is the official record. At one are carded by bureau inspectors. The cards are made out in triplicate, the original being tacked to the car and the other two sent to the bureau office. Where seals are found broken or defective, a seal marked "Chicago Bureau" is applied by the inspector. It has been found that about 33 per cent. of the cars interchanged at the stock yards have seals and that resealing is necessary in the case of only about 2 per cent. of these.

Where formerly the inspectors recorded the results of their inspection in note books and wrote up their reports at the close of the day, they now complete their reports on form sheets while the cars are before them, and messengers take the sheets to the bureau office, where the requisite number of copies is made.

Objection was at first made that this plan increased the clerical work of the inspector, but while he is required to record additional data, once his record is made he is relieved of clerical work, whereas formerly he was required to prepare his report at the close of the day and retain records of the cars he had inspected for future reference.

To obviate the difficulty of handling the large sheet required (9½ in. x 13¾ in.), a pocket size holder was devised, consisting of a back cover with stiff center leaves over which the sheet can be folded so that it can be conveniently handled. About 2,600 interchanges a day are made in the stock yards district, which covers an area of about 6 sq. miles, with approximately 200 miles of track.

The force required to handle the reports for the stock yards

district includes 43 inspectors, three foremen, two of whom are almost entirely engaged in making settlements with private car owners; one chief clerk and one assistant chief clerk; three clerks on miscellaneous work; seven typists and two messenger boys.

The sheets and defect card stubs prepared by the inspector are collected by messengers and taken to the bureau office at intervals throughout the day. The same messengers also, twice daily, after the typewritten reports are prepared in the office, take them from the bureau office to the trains for roads having offices outside of the city and to the clearing house established by the local agents for the roads for local delivery.

Upon arrival in the office any apparent errors in the inspectors' sheets are detected at once. After being stamped to show the order of arrival, they are passed to the typists, who prepare seven copies at one writing—one copy for the permanent file and one each for the agent, master mechanic and car accountant of the delivering and receiving roads. When the typists have placed the information upon the standard form of interchange report they place their initials on the inspector's sheet, and, after the sheet is compared with the transcription, it is sent to the permanent file, each day's reports being carefully bound for future reference.

The bureau office, after issuing its reports, proceeds on the theory that they contain errors, although it has been found that corrections are required for only about 1 per cent. of the total cars interchanged. In the stock yards district an opportunity for checking the inspectors' reports is afforded by the fact that the Chicago Junction Railway, in order to make its track service bills to the trunk lines using its tracks, employs number takers, who record the initials and numbers of cars as the trains pass a given point. The bureau's typewritten reports are compared at once with this track service record, and if they do not agree an investigation is instituted and continued until the facts are ascertained. In this way errors are detected and corrections issued from one to two weeks after the interchange takes place. This close check on the reports spurs the office and the bureau inspectors to accurate work, and it is felt that the percentage of error can in time be considerably lowered.

Prior to the installation of the bureau each railway employed its own man to make settlements with the private car owners. Now settlements are made by two foremen of the bureau, with a great saving in expense and the advantage of uniformity of method.

The eight assistants in charge of the various districts are all mechanical men, thoroughly experienced in car inspection. They are now engaged in making a careful study of the conditions at various points of interchange in their district and in instructing the inspectors in the use of the M. C. B. rules, as the Chicago district has been operating under special rules. Except in the stock yards district, the inspectors are employed by the railways. A study of the situation thus far, however, has shown that there are several points where one road delivers to many others at which the delivering road has but one inspector, who is kept busy while each of the receiving roads has its own inspector, and some of the latter are idle most of the time.

In such cases the matter will be laid before the interchange committee of the General Superintendents' Association, and, with its approval, the joint inspection plan will be established. For example, since the organization of the bureau, Mr. Schultz has obtained authority from the interchange committee to take over on February 1 the inspection of outbound cars moving from the Chicago, Burlington & Quincy to connecting lines at Western avenue, the so-called Burlington lumber district. At present 15 of the 21 connecting roads have inspectors at this point, while six make the inspection at their home yards. The bureau will be able to handle the work there with a smaller number of inspectors while having a more flexible force, reducing the expense of the inspection at this point from $658 to $450 per month. It is believed that important economies can be effected in this way at other points.

One way in which the joint committee believes the bureau method of inspection and reporting will be valuable is that it will afford a uniform basis of comparison as to the cost of securing an interchange report. Under the old system any figures obtainable were very misleading, because many of the men employed were doing other work, and all the lesser items could not be included. When the work is handled through a bureau every item of expense is charged against the cost of interchanging cars, there being no other service performed by the bureau. At the stock yards in Chicago it has been found that the cost per car is 7 cents. It is to be noted that this figure includes the cost to both roads.

If this amount were borne equally by the delivering and receiving lines the cost to each would be 3½ cents. The cost, however, is not in all cases divided equally between the roads parties to the interchange, but on an agreed basis.

A summary of the cost per car interchanged, apportioned between the different items that go to make up the total, was reported by the Committee on Joint Interchange and Inspection at the December meeting of the Association of Transportation and Car Accounting Officers as follows:

	Cost in cents per interchange.	Per cent. of total cost per interchange.
Inspection	$4.50	64.29
Office force (including messengers)	1.15	16.43
Settlers	.25	3.57
Supervision	.50	7.14
Total	6.40	91.43
Supplies, etc.	.60	8.57
	$7.00	100.00

The expenses for the maintenance of the bureau are paid by the General Superintendents' Association, which collects the assessments from the individual roads.

One of the chief advantages of the bureau plan is in the promptness with which reports are rendered to the interested lines. Where formerly no records were obtained until the inspector made up his report at the close of the day, the reports are now rendered twice daily, by noon for cars interchanged between noon and midnight of the previous day and by 5 p. m. for cars interchanged between midnight and noon.

During the early stages of the experiment many railway men feared that with the increased data required of the inspectors they might be inclined to slight the mechanical inspection in favor of the work required by the transportation department. It has been demonstrated, on the contrary, that the physical inspection has by no means deteriorated, and that the added requirement of a complete record for the transportation department, with the assurance of a check against the records, has been an incentive to more careful work. It is also believed that the combination of mechanical and transportation training received by the inspectors will assist in developing valuable material for promotion.

The establishment of the bureau method of reporting interchange has not met with entirely smooth sailing, but has encountered and overcome a great deal of opposition, particularly in its early stages. A plan similar to that adopted in Chicago has been in operation for some time at Pueblo, Col., and Des Moines, Iowa. Negotiations are now under way for establishing the same system at several other large centers.

All matters pertaining to the interchange of cars at Chicago are in general charge of an interchange committee of seven members, of which five must be mechanical officers of the roads belonging to the bureau and two members of the General Superintendents' Association. Meetings must be held by the committee at least once each month. The committee is composed as follows:

T. W. Demarest, superintendent motive power Pennsylvania Lines, Ft. Wayne, Ind., chairman; T. R. Morris, general foreman Chicago, Milwaukee & St. Paul, Chicago; D. R. MacBain, superintendent motive power Lake Shore & Michigan Southern, Cleveland; H. F. Wardwell, superintendent motive power Chi-

cago & Western Indiana, Chicago; H. H. Harvey, general car foreman Chicago, Burlington & Quincy, Chicago; C. B. Strohm, superintendent of transportation Atchison, Topeka & Santa Fe, Chicago; N. D. Ballantine, superintendent car service, Chicago, Rock Island & Pacific, Chicago.

The joint committee of the Master Car Builders' Association and the Association of Railway Transportation and Car Accounting Officers has been materially assisted in bringing about a practical test of this plan by the members of the American Association of Railroad Superintendents both individually and as a body, and also by the American Association of Freight Agents in the Chief Interchange Inspectors' Association. The men in charge of the work invite railway men to visit the office when in Chicago and see for themselves how it is being handled.

MIKADO LOCOMOTIVES FOR THE ERIE.

The Erie Railroad has been reducing grades and providing additional tracks for several years. The grades are still high, however, on that part of the Cincinnati division between Marion, Ohio, and Kent, about 112 miles, of which a profile is shown herewith. There is now a second track on nearly all of that division, the terminal facilities have been enlarged, and, finally, heavier power has been bought. Consolidation engines of 42,500 lbs. tractive effort and of 200,700 lbs. weight in working order have heretofore been used for power on this division. In considering how this power should be increased the advantages of both the Mallet and mikado types were studied with respect to this particular division. As a result of this investigation, it was found that the mikado would be more practical in this specific case. The designs were made by the road and 35 locomotives were ordered, 20 from the Baldwin Locomotive Works and 15 from the American Locomotive Company.

The locomotives are designed to haul 1,450 tons westbound and 1,520 tons eastbound, which is about 38 per cent. increase in tonnage. The Baldwin engines have been delivered and are performing satisfactory service. They are somewhat similar to those recently built for the Chesapeake & Ohio, described in the *Railway Age Gazette* of February 2, 1912, and the dimensions of which are shown in the accompanying table. These C. & O. engines have shown excellent results; in a recent test made with a dynamometer car they developed a draw bar pull of 27,000 lbs. at a speed of 33 m. p. h., which is equivalent to 2,390 h. p. at the draw bar. In comparing these locomotives with the new Erie engines, it is interesting to note that although they are a little different in their general dimensions, having a smaller driver and cylinders 1 in. larger in diameter, their ratios are very nearly alike, the greatest difference being in the per cent. of fire box heating surface to total heating surface, which is accounted for by the use of a combustion chamber in the Chesapeake & Ohio engines.

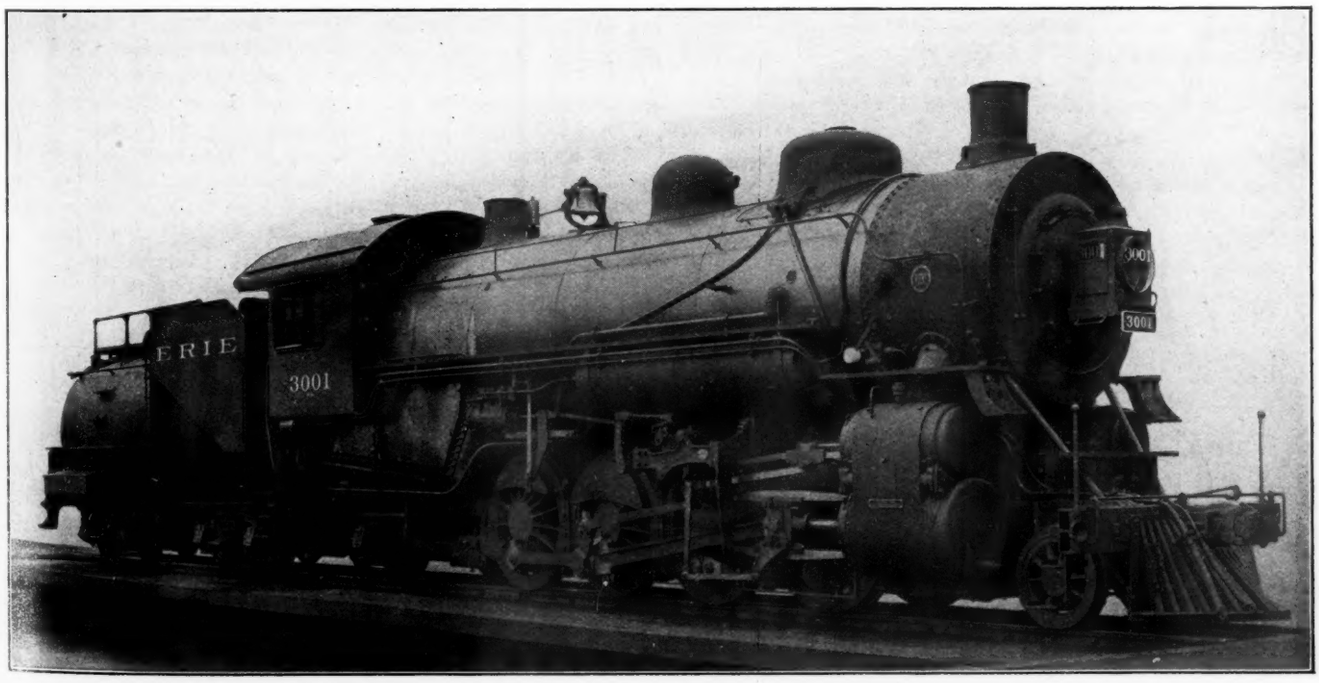
COMPARATIVE DIMENSIONS OF RECENT MIKADO LOCOMOTIVES.

Type	2-8-2	2-8-2	2-8-2	2-8-0
Road	Erie.	C. & O.	G. N.	Erie.
Total weight, lbs.	320,600	315,000	287,000	200,700
Weight on drivers, lbs.	237,150	243,000	220,000	176,400
Percentage of weight on drivers	74	78	76.5	88
Average weight per axle, lbs.	59,288	60,750	55,000	44,100
Tractive effort, lbs.	57,460	60,800	57,460	42,500
Cylinders, diameter and stroke, in.	28 x 32	29 x 28	28 x 32	22 x 32
Diameter drivers, in.	63	56	63	62
Boiler pressure, lbs.	170	170	170	200
Diameter of boiler, in.	84	83¾	82	..
Tubes, number	232	238	326	380
Tubes, number (superheater)	36	40	30	..
Tubes, diameter, in.	2¼	2¼	2	2
Tubes, length, ft.	21	19	21	16
Heating surface, evaporating, sq. ft.	4,155	4,051	4,720	3,340
Heating surface, superheating, sq. ft.	845	832	1,060†	..
Grate area, sq. ft.	70	66.7	78.2	54
Weight on drivers ÷ tractive effort.	4.13	4.00	3.84	4.15
Tractive effort × diameter of drivers ÷ *equivalent heating surface.	666	643	574†	789
Total heating surface ÷ grate surface	59.5	60.7	60.4	61.9
*Equivalent heating surface ÷ grate surface	77.5	79.4	80.7†	..
Firebox heating surface ÷ *equivalent heating surface, per cent.	4.03	5.35	3.94†	5.21
Total weight ÷ *equivalent heating surface	59.1	59.4	45.4†	60
*Equivalent heating surface ÷ volume of cylinders.	238.4	248	277.8†	237
Grate area ÷ volume of cylinders.	3.08	3.12	3.43	3.83

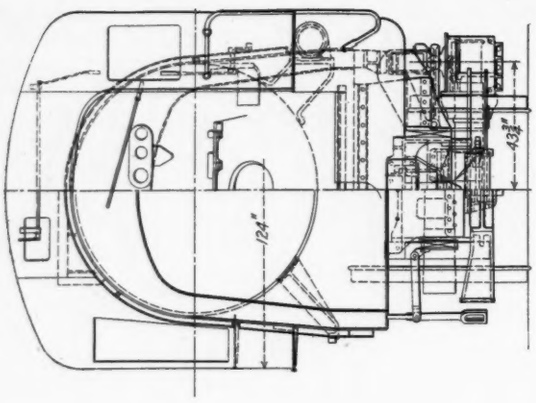
*Equivalent heating surface equals evaporating surface plus 1½ times superheating surface.

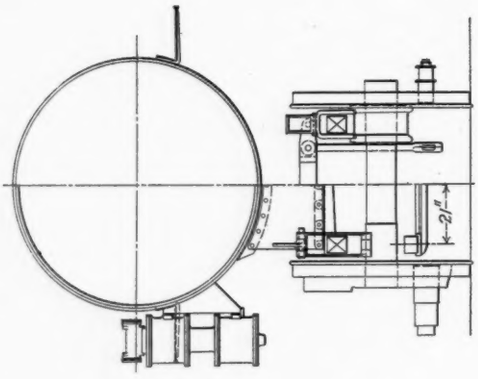
†Superheating surface was measured on outside of tubes.

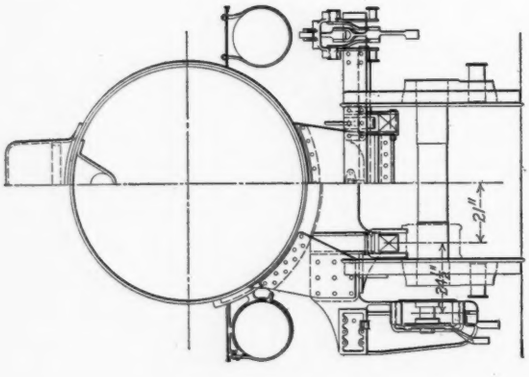
Compared with the consolidation locomotives, the new Erie mikados show an increase in tractive effort of 35 per cent. and 31 per cent. increase in weight on driving wheels. The consolidations use saturated steam while the mikado engines are equipped with Schmidt superheaters. The water evaporating surface of these locomotives is greater than that of the consolidation engines, which with the superheating surface gives an increase of approximately 50 per cent. in rela-

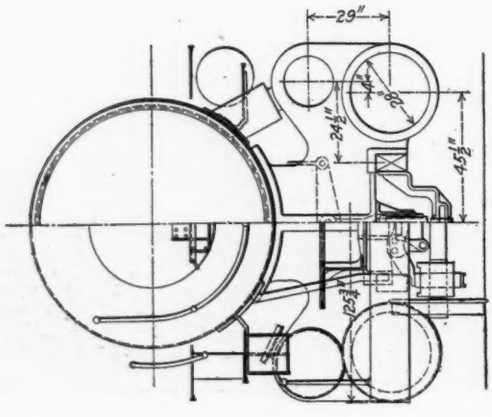


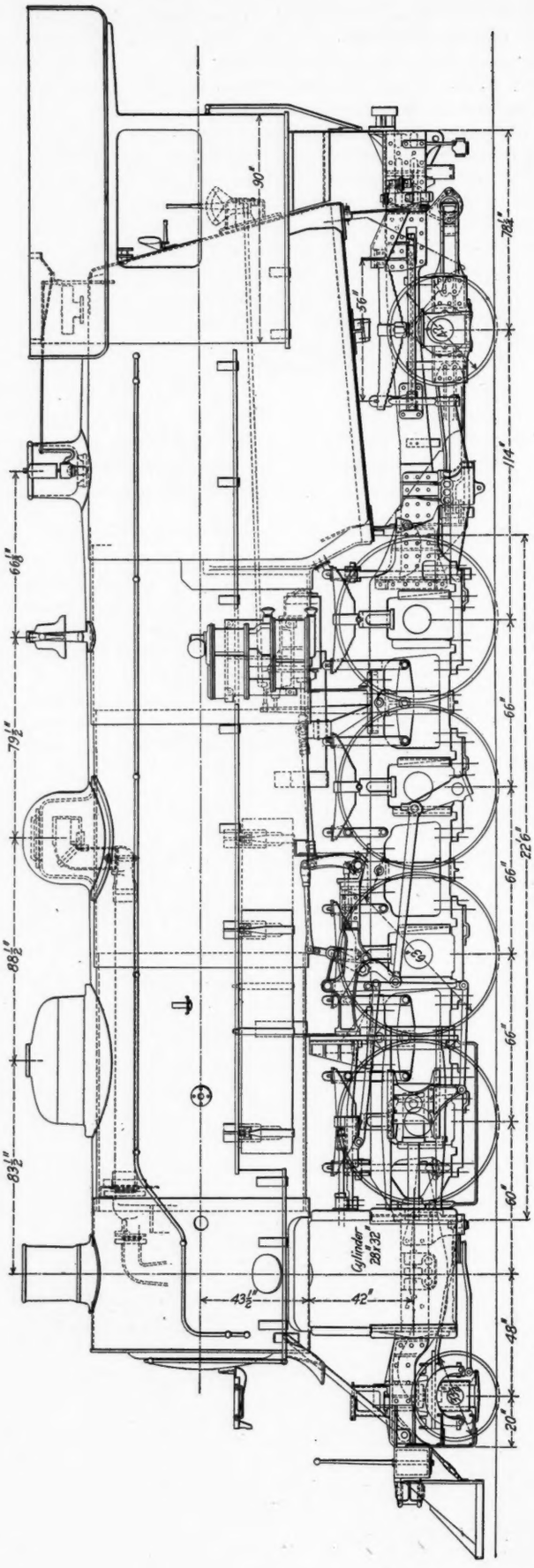
160-Ton Mikado Locomotive for the Erie Railroad.









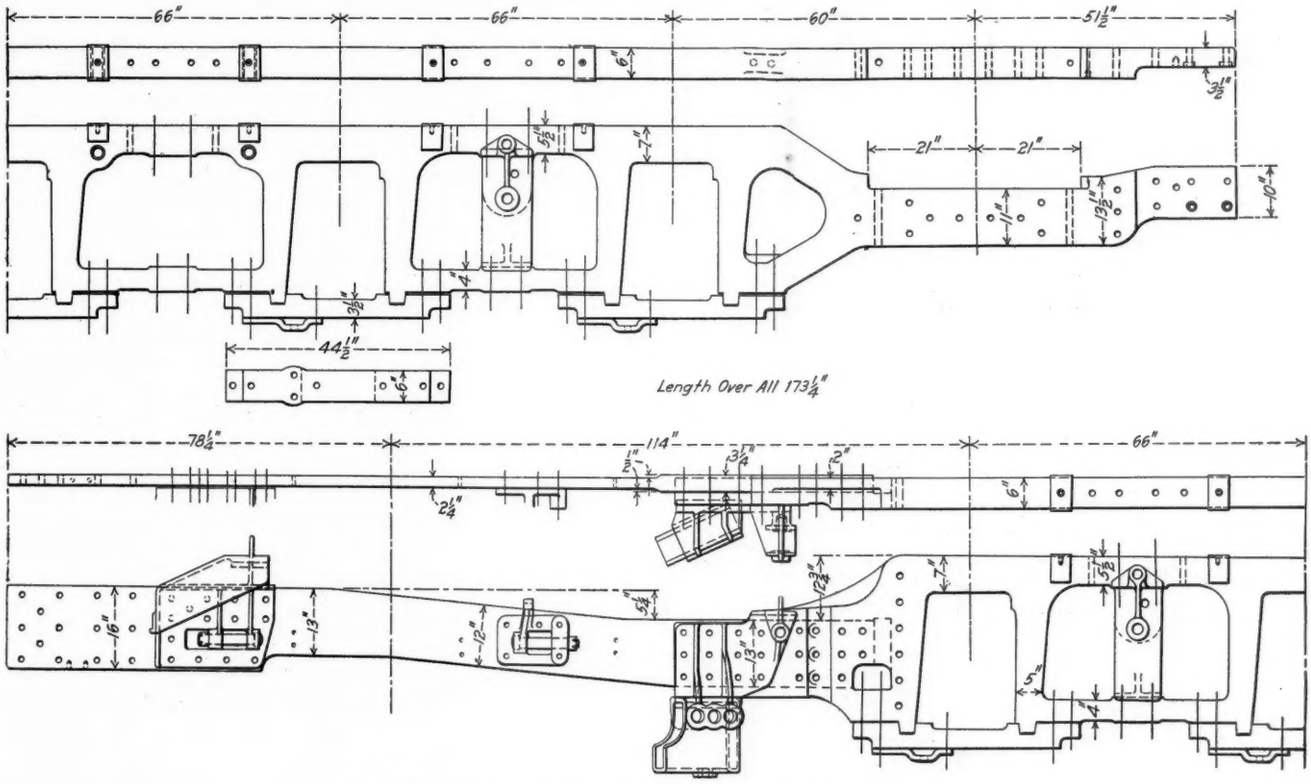


Mikado Locomotive for the Cincinnati Division of the Erie Railroad.

tive boiler capacity. This means increased hauling capacity for the new engines plus the added advantage of taking the larger tonnage at a higher speed than could be maintained by the consolidated locomotives.

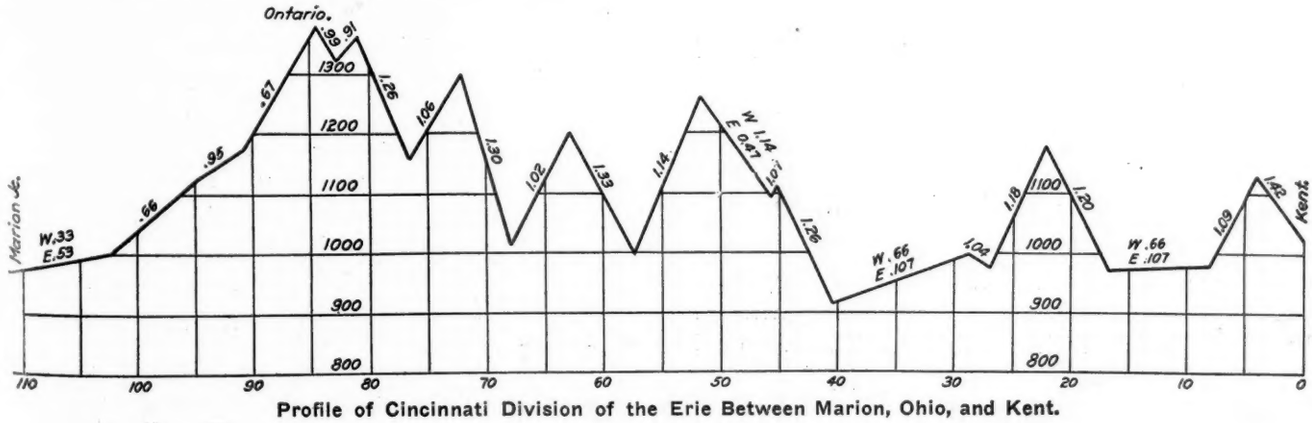
The table also includes a comparison with the mikado engines built for the Great Northern, described in the *Railway Age Gazette* of December 15, 1911, which when directly compared shows that the Erie engine is of considerably greater weight for practically the same power and, judged on the basis of heating surface, it has a smaller boiler. A more careful study of the details, however, shows that the greater total weight is largely accounted for in three features; first, the use of frames 6 in. in width as compared with 5 in. in the Great Northern; the 84 in. boiler has sheets 15/16 in. in thickness as compared with an 82 in. boiler with ⅞ in. sheets on the Great Northern; there is a smaller number of 2¼ in. tubes giving a considerably greater water capacity and hence increased weight in the boiler. The Erie superheater has 36 elements as compared with 30 in the Great Northern, but the tubes in the latter case are 1⅝ in. diam. as compared with 1 7/16 in. on the Erie. The ratio of superheating surface to evaporate surface, is considerably larger on the Great Northern, due to the larger number of boiler tubes. One very striking difference in the two designs is found in the 13 in. piston valves on the Great Northern as compared with 16 in. on the Erie.

The boilers of the mikado are 84 in. in diameter which increases to 87¾ in. at the firebox. The firebox is radially stayed, and the front end of the crown is supported by four transverse rows of flexible bolts, which are used instead of the customary arrangement of T-irons and expansion links. The depth of the throat, measured from the under side of the barrel to the bottom of the mud ring, is 25 in. This provides ample room for the Security brick arch, which is supported on four 3-in. water tubes. The superheater provides 845 sq. ft. of superheating surface, and the elements are located in 36 tubes each 5½ in. in diameter. The dome base and body are flanged from a single piece of steel plate. The longitudinal seams are all placed on the top center line, and are welded at the ends, having diamond shaped welt strips on the inside.



Heavy Vanadium Steel Frames for Mikado Locomotive.

The frames are of vanadium cast steel and the back sections are made of hammered iron. The front frames are single and are cast in one piece with the main frames, which are 6 in. wide, and 7 in. in depth over the pedestals. The rear frames are made in the form of slabs and are 2¼ in. wide. The equalization sys-



Profile of Cincinnati Division of the Erie Between Marion, Ohio, and Kent.

tem is divided between the second and third pairs of driving wheels and the spring links are here held by pins which pass through lugs cast in the frames.

The steam pipes in these locomotives pass out through the sides of the smoke box, and deliver steam directly to the steam chests, thus giving a less complicated and a stronger casting. The steam distribution is controlled by 16-in. piston valves which are driven by the Baker-Pilliod valve gear. The valves are set with a maximum travel of 6 in. and a constant lead of ¼ in. The steam lap is 1 in. and the exhaust clearance 1/16 in. The valve motions are controlled by the Ragonnet power gear. This gear was used as it provided a much more convenient cab arrangement than would the ordinary type lever and quadrant.

The tender is of the Vanderbilt type, having a capacity for 9,000 gallons of water and 16 tons of coal. The tank has a diameter of 8 ft. 9 in., and the frame is composed of 6 in. x 4 in. angles, with steel bumpers. The trunks have cast steel side frames and steel tired wheels. The following table contains the important dimensions and ratios of these engines:

General Data.

Type	2-8-2
Service	Freight
Fuel	Soft coal
Tractive effort	57,460 lbs.
Weight in working order	320,600 lbs.
Weight on drivers	237,150 lbs.
Weight of engine and tender in working order	483,000 lbs.
Wheel base, driving	16 ft. 6 in.
Wheel base, total	35 ft.
Wheel base, engine and tender	66 ft. 10½ in.

Ratios.

Total weight ÷ tractive effort	5.58
Weight on drivers ÷ tractive effort	4.13
Tractive effort × diam. drivers ÷ heating surface	870.
Tractive effort × diam. drivers ÷ *equivalent heating surface	666.
Total heating surface ÷ grate area	59.5
Total *equivalent heating surface ÷ grate area	77.5
Firebox heating surface ÷ total heating surface, per cent.	5.27
Firebox heating surface ÷ total *equivalent heating surface, per cent	4.03
Weight on drivers ÷ total heating surface	57.0
Weight on drivers ÷ total *equivalent heating surface	43.7
Total weight ÷ total heating surface	77.1
Total weight ÷ total *equivalent heating surface	59.1
Volume both cylinders, cu. ft.	22.78
Total heating surface ÷ vol. cylinders	182.7
Total *equivalent heating surface ÷ vol. cylinders	238.4
Grate area ÷ vol. cylinders	3.08

Cylinders.

Kind	Simple
Diameter	28 in.
Stroke	32 in.

Valves.

Kind	Piston
Diameter	16 in.
Travel	6 in.
Lead	¼ in.

Wheels.

Driving, diameter over tire	63 in.
Driving, thickness of tire	3½ in.
Driving journals, main, diam.	11 in. x 14 in.
Engine truck, diameter	33½ in.
Engine truck journals	6 in. x 12 in.
Trailing truck, diameter	42 in.
Trailing truck journals	8 in. x 14 in.

Boiler.

Style	Straight
Working pressure	170 lbs.
Outside diameter of first ring	84 in.
Firebox, width and length	84 in. x 120 in.
Firebox plates, thickness	⅜ in.
Firebox water space	6 in.
Tubes, number and diameter	232—2¼ in.
Tubes, number and diameter (superheater)	36—5½ in.
Tubes, length	21 ft.
Heating surface, tubes	3,936 sq. ft.
Heating surface, firebox	188 sq. ft.
Heating surface, arch tubes	31 sq. ft.
Heating surface, total	4,155 sq. ft.
Heating surface, superheating	845 sq. ft.
Heating surface, total equivalent	5,422.5 sq. ft.
Grate area	70 sq. ft.

Frame.

Over pedestal, width and depth	6 in x 7 in.
Top rail, width and depth	6 in. x 5½ in.
Bottom rail, width and depth	6 in. x 4 in.

Tender.

Tank, style	Vanderbilt
Frame	6 in. x 4 in. angles
Wheels, diameter	33 in.
Journals	6 in. x 11 in.
Water capacity	9,000 gals.
Coal capacity	16 tons

*Total equivalent heating surface equals total heating surface (4,155 sq. ft.) plus 1½ times superheating surface.

CANADIAN RAILWAYS IN 1911.

BY J. L. PAYNE,
Comptroller, Department of Railways and Canals.

An increase of 669 miles in the main track railway mileage of Canada during the year ended June 30, 1911, bringing the total up to 25,400, scarcely represents the real growth in that regard; for there were 1,600 additional miles in operation which were officially regarded as being still under construction. These figures leave the Dominion in the unique position of having the largest railway mileage per capita of population of any country in the world, despite the rapid peopling of the western provinces during the past ten years. At the same time, there were nearly 7,000 miles of line actually under construction; so that the year was marked by unprecedented activity in respect to railway building.

Probably 70 per cent. of the construction work under way at the close of the statistical year was located west of the great lakes, and all but two or three hundred miles of the remainder constitutes the eastern section of the new Grand Trunk Pacific. When all these projects are completed, Canada will have three lines extending across the continent—the Canadian Pacific, the Canadian Northern and the Grand Trunk Pacific—together with a network of branch roads running north and south. The fact that upwards of 3,000 miles of additional road was surveyed during the past year may be taken as indicating the unsatisfied and immediate transportation needs of the West. Canadians were undoubtedly disappointed when the census of 1911 revealed a population of only a little over seven millions; but they are inspired by a deep and abiding faith in their northern heritage, and this spirit of optimism will probably find its most striking demonstration during the next decade in the continued providing of these facilities which come under the comprehensive head of transportation.

No one is heard to complain because the aid given in one form and another to transportation projects by the federal and various provincial governments, as well as by municipalities, now foots up a total of fully a billion dollars. No other people on earth have made such large sacrifices in that regard. In the account is included cash subsidies to the extent of $202,179,254, government lines $119,615,000, canals $98,000,000, guarantees $148,336,357, and land grants of 55,256,429 acres. About 20,000,000 acres of these railway lands are still held for sale, and the fact that the price has gone up to from $10 to $30 an acre, and is rising rapidly, affords some notion of the value of the assistance given in this form. At least $100,000,000 might be added for harbor work, terminal equipment, the providing and maintenance of aids to navigation, and the upkeep of inland waterways.

The expansion of railway mileage during 1911 was reflected in an addition of $118,391,514 to capital liability. The total on June 30 amounted to $1,528,689,201, made up of stocks, $749,207,687, and funded debt, $779,481,514. This capitalization represents an average of $60,184 per mile of line; but, after deducting duplication and allowing for the situation with respect to government owned lines, the true average is shown to be $55,829 per mile. The dividends paid on share capital during the year aggregated $30,577,740. The rapidly growing financial strength of Canadian railway interests during the past five years is shown in the following statement:

	Dividends Paid.	Share Capital.	Per Cent.
1907	$12,760,435	$588,568,591	2.17
1908	12,955,423	607,891,349	2.11
1909	19,230,126	647,534,647	2.97
1910	21,747,414	687,557,387	3.16
1911	30,577,740	749,207,687	4.08

An increase of 141 per cent. in dividends paid is highly satisfactory. It indicates efficiency, swelling traffic and sound administration.

The public service of Canadian railways during the past year was shown in the carrying of 37,097,718 passengers and 79,884,28?

tons of freight—an increase, over 1910, of 1,203,143 passengers and 5,401,416 tons of freight. These results, having regard to all the conditions which obtained during the year, were satisfactory. Ten years ago the number of passengers carried was 20,679,974, and the volume of freight moved was 42,376,527 tons.

The number of passengers carried one mile was 2,605,968,924, representing an increase of 139,239,260 as compared with the preceding year. The passenger density was 102,597, which is rather low as compared with the United States; but it compares favorably with 90,921 four years ago. The average passenger journey was 70 miles, which I believe to be the highest in the world; but the average number of passengers per train was only 60. We have not in Canada the immense commutation business which so greatly fattens the passenger density of the United States, particularly in the eastern states. In fact, we have relatively little of that sort of traffic. This is why the average receipts per passenger of $1.360 is high, while the average of 1,460 passengers per mile of line is comparatively low. Yet in all these receipts there is a persistent tendency toward betterment and toward the conditions which prevail across the boundary. The average receipts per passenger per mile were 1.944 cents. It may be explained that we have in Canada an almost uniform rate of three cents per mile, and five cents per mile for a return ticket; but half fare for children and excursion rates bring the average below two cents.

The two cent agitation, it might be observed parenthetically, has never obtained a foothold in the Dominion, and one rarely hears the matter mentioned. Possibly our people are too glad to have the railways to think of crippling them with restrictive legislation. We have an exceedingly capable railway commission, possessed of wide jurisdiction and sustained not only by undisputed statutory powers, but by a vigorous public judgment. This board exercises full control over the rates of railway, express, telephone and telegraph companies, and the department of railways has jurisdiction with respect to location and statistics. In this situation there is not that disposition in Canada to tinker the laws relating to railways which is so observable in the United States.

The gain of 7.2 per cent. in the volume of freight handled in 1911 was the natural result of commercial and industrial prosperity. Incidentally, that very activity had something to do with the defeat of reciprocity in September last. Notwithstanding, however, the larger tonnage, the freight density of the Dominion declined from 635,321 ton miles to 631,829 during the year. On the other hand, the average receipts per ton per mile rose from .739 to .777 cent, due, among other causes, to a very substantial increase in the tonnage of manufactures. The average train load declined from 311 to 305 tons, and the average load per car from 17.13 tons to 16.91 tons. In the face of a steady increase in the capacity of freight cars, and a larger volume of traffic, this situation cannot be easily explained. The average freight haul also came down from 211 miles to 200 miles, although that figure still leaves Canada with the longest average haul. The number of tons hauled one mile was 16,048,478,295—a gain of 336,350,594 over the year 1910.

The following analytical statement of freight traffic in 1911 will be both interesting and illuminating:

	Tons.	Per Cent.
Products of agriculture	13,809,536	17.17
Products of animals	3,190,702	4.00
Products of mines	28,652,236	35.87
Products of forests	13,238,347	16.57
Manufactures	13,573,487	17.00
Merchandise	2,438,089	3.06
Miscellaneous	4,981,385	6.33

The increase in manufactures in 1911 over 1910 amounted to 3,559,708 tons, and brought the percentage up from 13.44 to 17.00.

Aggregate earnings were $188,733,494, showing $14,777,277 increase over 1910. The betterment was equal to 8.7 per cent. Operating expenses totaled $131,033,785, or 8.8 per cent. more than for the preceding year. The ratio of operating cost to earnings was 69.4 per cent., which was somewhat better than the average for the past five years. The difference between gross earnings and operating expenses, popularly spoken of as net income, was $57,698,709—an increase for the year of $4,147,932. After making deductions for dividends, taxes, etc., the amount carried forward to profit and loss was $14,150,465, which is quite the best result achieved in the history of Canadian railways. Gross earnings were equal to $7,430.45 per mile of line, which was $396.52 ahead of 1910. The gross earnings of 1910 and 1911 came from the following sources:

	1910.	1911.
Passengers	$46,018,880	$50,566,894
Mails	1,779,881	1,869,414
Express	4,143,838	4,674,135
Baggage, parlor cars, etc.	993,614	1,207,555
Freight	117,497,604	126,570,533
Station and train privileges	679,061	826,252
Telegraphs, rents, etc.	2,873,333	3,018,710
Total	$173,956,217	$188,333,494

Earnings from mails have increased 14.8 in four years, and from express 42.5.

Passenger trains earned $1.348 per train mile, and freight trains $2.376 per train mile. The average earnings per ton of freight were $1.561. Outside operations realized gross earnings of $19,444,893 during the year, with expenses attached of $14,150,465. These operations related largely to the steamship lines of the Canadian Pacific and Canadian Northern, as well as to the hotels of the same companies. The Grand Trunk has begun the erection of hotels; but has not thus far gone into the steamship business.

Operating expenses for the year amounted to $131,034,785, or $10,629,345 more than for 1910. The unproductive character of new mileage was mirrored in the fact that the cost of operation represented an increase of $290 per mile of line, bringing the total up to $5,159. As compared with four years ago, operating expenses per mile have swollen $538, and therein would seem to lie one of the gravest problems which just now confronts managers of railways on this continent. Another way of measuring the rising scale of operating cost, and perhaps the best way available, has reference to the expenses per train mile. Fifteen years ago it cost an average of .775 cent to run a train one mile; ten years ago the figures had risen to $1.117; five years ago to $1.381, and this year to $1.460. A three years' comparison of the five divisions of operating expenses gives the following result:

Operating Expenses.	1909.	Per Cent.	1910.	Per Cent.	1911.	Per Cent.
Way and structures	$21,153,274.46	20.22	$27,035,603.46	22.45	$29,245,093.22	22.32
Equipment	21,510,303.59	20.56	26,002,301.30	21.59	26,127,638.12	19.94
Traffic exp.	3,798,824.57	3.63	4,366,176.92	3.63	4,831,744.50	3.69
Transportation.	54,284,587.41	51.89	58,928,170.74	48.94	66,343,269.58	50.63
General exp.	3,853,094.40	3.70	4,073,188.00	3.39	4,487,039.53	3.42

It will be seen that the physical upkeep of Canadian railways was well maintained in 1911. The lower percentage for equipment, however, possibly had something to do with the abnormal shortage of cars which prevailed toward the end of the calendar year. Nevertheless, maintenance of equipment represented $1,024 per mile of line in 1911, as compared with $965 in 1907. A still higher ratio of increase for maintenance of way and structures was established, the figures being $930 per mile of line in 1907, and $1,151 in 1911—an increase of 23.6 per cent. in four years.

Turning to the matter of equipment, it is worthy of note that 140 locomotives, 193 passenger cars, 7,445 freight cars, and 930 cars in company's service were added in 1911. These additions brought the totals up as follows: Locomotives, 4,219; freight cars, 127,158, and passenger cars, 4,513. The tendency toward larger and heavier units is shown in the fact that while the average capacity of freight cars in service was 27.6 tons in 1907, it was 29.5 tons in 1911. There were, for example, 6,070 cars of 100,000 lbs. capacity in 1911, as against 3,448 in 1908. Cars of 80,000 lbs. capacity rose in number from 9,790 in 1908 to 14,075 in 1911. On the other hand, during the same period the old standard 40,000 lbs. cars decreased from 25,855 in 1908 to 18,899. Notwithstanding steady additions, the available supply

of rolling stock per 1,000 mills of line still falls considerably below the American standard. The Canadian figures are: Locomotives, 166; freight cars, 5,006, and passenger cars, 177. The process of betterment has been quite marked during the past five years in particular; but there is still room for improvement.

Revenue trains had a total mileage of 89,716,533, divided as follows: Passenger trains, 36,985,911; freight trains, 46,220,813; mixed trains, 6,277,468, and special trains, 232,341. Locomotives ran 111,975,176. Car mileage was distributed in this way: Loaded freight cars, 946,946,917; empty freight cars, 311,984,866, and caboose cars, 47,834,318. It might be observed at this point that all the statistics which appear in this article are directly comparable with those of the United States, since they are based upon classifications in all essential respects identical with the prescriptions of the Interstate Commerce Commission.

The fuel bill for 1911 of $20,182,103 was created by the consumption of 6,800,648 tons of coal at an average cost of $2.97. To run 100 miles the tons of fuel consumed by locomotives hauling the various classes of trains was as follows: Freight, 7.78; passenger, 4.91; mixed, 5.10; switching, 4.14, and construction, 4.48.

For the first time, official information was gathered in 1911 with regard to the despatching of trains by telephone instead of telegraph. It was found that 3,306.33 miles of line had been operated under the new system, or 13 per cent. of the whole. It may safely be assumed that this mileage will be largely increased during the current year. The telephone has been highly satisfactory.

An addition of 17,456 during the year brought the total number of railway employees up to 141,224, to whom $74,613,738 was paid in salaries and wages. Of this number, 19,118 were attached to outside operations, and their remuneration aggregated $6,976,208. The increase of total compensation over 1910 was equal to 11.08 per cent., and therein lies the chief reason for the ascending scale of operating expenses. Comparing 1911 with 1910 the distribution of salaries and wages was as follows:

	1910.	1911.
Way and structures	$16,502,902	$18,157,696
Equipment	14,775,782	15,544,057
Traffic expenses	1,313,980	1,564,399
Transportation expenses	32,091,952	36,832,034
General expenses	2,483,177	2,515,552
Total	$67,167,793	$74,613,738

Further information with regard to the wages situation will be found in the following table, showing the average rate of daily compensation to the various classes of employees in 1910 and 1911:

Employees.	1910.	1911.
General officers	$10.72	$11.72
Other officers	4.73	4.84
General office clerks	1.94	1.98
Station agents	2.16	2.28
Other stationmen	1.65	1.73
Enginemen	4.12	4.40
Firemen	2.53	2.78
Conductors	3.30	3.62
Other trainmen	2.12	2.44
Machinists	2.98	3.14
Carpenters	2.52	2.44
Other shopmen	2.19	2.22
Section foremen	2.18	2.32
Other trackmen	1.58	1.66
Switch tenders, etc.	1.57	1.98
Telegraph operators	2.20	2.28
Employees—floating equipment	2.19	1.11
All other employees	1.95	1.87

The distressing story of accidents during the year must be told. The number of persons killed was 495, and the number injured 3,329. Of these 28 were killed and 1,423 injured from other causes than the movement of trains. The accidents resulting from the movement of trains occurred to the following classes of persons:

	Killed.	Injured.
Passengers	28	288
Employees	202	1,314
Trespassers	185	154
Non-trespassers	48	135
Postal clerks, etc.	2	15
Total	465	1,906

This is a better record than for several years. One passenger in every 1,324,919 was killed, and one in every 124,489 was injured. The causes of death were: Collisions, 4; derailments, 1; falling from trains, 10; jumping on or off trains, 11; struck at highways, 1; struck at stations, 1, and other causes, 2. The injuries to passengers occurred from: Collisions, 43; derailments, 88; falling from trains, 34; jumping on or off trains, 67; struck at highways or stations, 6, and other causes, 50. Collisions accounted for the killing of 34 employees and the injuring of 119, while derailments caused the death of 10 and the maiming of 67.

Considerable interest attaches in Canada to those accidents which occur at highway crossings, because of the movement for the elimination of this menace to public safety. Thirty-six persons were killed and 108 injured at such intersections in 1911. This was the best showing in years, both actually and relatively, and it may have been due in large measure to the fact that the Board of Railway Commissioners has taken a firm stand in the matter of protective measures. The increase of overhead bridges and subways during the past three years, particularly in rural and semi-rural districts, has been large, in addition to which many electric bells and gates have been installed. Within two years 132 level crossings have been eliminated by this means, and the work may be regarded as having just begun. The expense is borne by the railway, the municipality and government.

It seems to me the statistical matter which unavoidably makes up the body of this contribution clearly points to a healthy and encouraging railway situation in Canada. The rapid settlement of the western provinces means the production of a swelling volume of grain for export, and this expansion has its reciprocal in a rising demand upon the industries and commerce of the east. All activity in the life of a nation produces traffic. This was the experience of the western states, and history is merely repeating itself north of the 49th parallel. The business of railways is increasing, and in return the public is being given a better service in all respects. The ambition and faith of our people are finding their most definite demonstration today in the planning and building of railways; and in these efforts they are merely showing a sane appreciation of the importance of transportation to a relatively new and developing nation.

FOREIGN RAILWAY NOTES.

The New South Wales public works committee is now considering the question of the construction of a railway from Henty to Daysdale, a distance of 46½ miles. The estimated cost of the line built with 80-lb rails is $1,070,655. It is anticipated that at first the revenue to be derived from the line will be $32,730 and the expenditure $56,895.

Construction on the proposed railway from Yunnanfu, China, to Lanchowfu, on the Yangtse river, in the province of Szechwan is being held up. The matter of freight rates over the French railway from Haifong, in French Indo-China, to Yunnanfu, is of such controlling importance that the projectors of the line are seriously considering the construction of a line from Yunnanfu to Nanning, on the Yoo river in the province of Quang Se, as a means of avoiding these excessive charges, as well as opening up the province of Yunnan and West China by the new route. This road would give communication by rail and water with Hongkong and Canton. This enterprise is not exactly an alternative of the construction of what is known as the Szechwan Railway but it seems to be generally understood that the construction of the railway to Nanning will postpone the construction of the line from Yunnanfu to the Yangtze. The survey work of the line to Nanning was newly completed last November, and the immediate construction of either the Szechwan Railway or the line to Nanning seems to depend entirely upon the early settlement of political disturbances in China generally. The detailed survey of the line from Yunnanfu to Lanchowfu, under the direction of two American engineers, was also nearly completed last November, and the preliminary work has been disposed of.

General News Section.

The Butte, Anaconda & Pacific, a 27-mile railway, operated by the Amalgamated Copper Company between Butte and Anaconda, Mont., is to be equipped for electrical operation.

Representative Berger, socialist, of Wisconsin, has introduced in Congress a bill to provide for government ownership of railways, telegraphs, telephone lines, and express companies.

Two suits for violation of the 28-hour law in the transportation of live stock have been filed in the United States district court at Chicago against the Lake Shore & Michigan Southern.

On the evening of February 5, Col. George A. Zinn of the United States Army addressed the Western Society of Engineers on "Chicago Waterways in Their Relation to Transportation."

Suit has been begun in the Federal Court at New York against the Erie to recover penalties for 51 alleged violations of the hours-of-service law. The charges relate to trips of trainmen made between April and September last.

The Canadian Society of Civil Engineers has authorized the expenditure of $100,000 for a new building for the society in Montreal. The present building of the society has been sold and a committee has been appointed to consider the selection of a new site.

Evidences that the present winter is one of the coldest for many years have been multiplied in many quarters. The latest news is from far off Saskatchewan, where the Grand Trunk Pacific, it is said, has shut off the free passes of the members of the provincial legislature.

James B. Hall of Chicago has brought suit in the Dane County Circuit Court, Wis., against the Chicago, Milwaukee & St. Paul, for violation of a law passed by the 1911 legislature which requires that the upper berth in sleeping car shall be closed unless occupied.

The voters of Seattle will be asked to approve at the March election the plan of the Seattle Port Commission, providing for an issue of $3,000,000 of bonds for the purpose of acquiring land and building six ocean piers as the initial step in building a $7,500,000 ocean terminal at Harbor Island.

Representatives of the firemen's brotherhood have asked the officers of the New York Central for a general conference looking to readjustment of wages and working conditions; and it appears that the firemen intend to follow the enginemen in a general movement for increased wages throughout the eastern states.

F. P. Gutelius, of Montreal, now general superintendent of the Eastern division of the Canadian Pacific, and George Lynch-Staunton, K. C., of Hamilton, have been appointed by the Canadian government to investigate the long series of transactions involved in the construction of the National Transcontinental Railway.

The Atchison, Topeka & Santa Fe has made a change in its pension rules so that an employee who has been continuously in the service of the company for 15 years or more may receive a pension, if permanently incapacitated, without the necessity for showing that the disability was caused by employment in the service of the company, provided it has not been due to misconduct.

The Chicago & North Western, in connection with the Union Pacific, will run special colonist trains from Chicago to San Francisco during the period of reduced colonist rates from March 1 to April 15. Last year the through trains ran only from Omaha westward, passengers from Chicago and the east being required to change cars there. Meals in dining cars at reduced rates will be a feature of the service.

A public utilities law is being agitated in Indiana. Governor Marshall proposes a plan to extend the powers of the railway commission as being less expensive and equally good. "We have rearranged things in the commission," says the Governor, "so that now we have expert subordinates doing much of the work formerly done by the commissioners or left undone. A new law should give the commission increased powers; power to employ experts to go into the questions involving public utilities control."

The Rock Island *Employees' Magazine* prints the names of the roadmasters and section foremen of the Rock Island system to whom have been awarded $3,825 in premiums for excellence in their work during the past season. There are 17 divisions, and on nearly every one of these divisions a roadmaster's prize of $100, and three or four prizes to section foremen of $50 each, were awarded. Of the total amount, $1,425 went to roadmasters and $2,400 to section foremen. Two of the foremen, one in Arkansas and one in Louisiana, were colored men.

The New York State Civil Service Commission, Albany, wants candidates for the position of examiner, division of statistics and accounts, Public Service Commission, Second district; salary $1,800. No written examination will be held, but candidates will be rated on submitted papers. Men of experience in corporation accounting are desired. Applications must be filed not later than February 24. Candidates are wanted also for the position of statistical clerk, salary $1,200 to $1,500; applications received till February 19.

Operating officers of the Texas railways held a conference with the state railway commission on January 30 to discuss methods of improving the train service in the state by stricter adherence to schedules. The commission has recently instituted several suits against the roads for violation of the state law requiring that an extra train be run whenever a train is 30 minutes late. Chairman Mayfield said that penalties had not produced results and suggested a lengthening of schedules. This was opposed by the railway men, who declared that the lateness of the trains recently had largely been caused by severe weather conditions and other circumstances beyond their control; but they agreed to consider the adoption of slower schedules during the winter months.

The committee of the Chicago city council on harbors, wharves and bridges, on February 5 decided not to approve the proposed contract between the Illinois Central and the Board of South Park Commissioners by which the railway was to exchange its riparian rights to the shore of Lake Michigan between Park Row and Fifty-first street, together with property now occupied by its passenger terminal, for a grant of additional land to widen and straighten its right of way. The plan was proposed by the park board to provide for making a municipal park on land to be filled in along the shore line, and also to provide for the erection of the Field Museum on the site of the present station, in accordance with the plans of the city plan commission. The railway was to have built a new passenger station at the corner of Twelfth street and Michigan avenue. The committee decided, instead of accepting the contract, to ask for a special session of the state legislature at which the city will ask for legislation giving the park board the power to condemn the riparian rights of the Illinois Central. The rejection of the plan, which had been approved by the park commissioners, by members of the city plan commission and by the mayor, as well as by the principal newspapers of the city, was the result of an agitation instituted by members of the City Club, who declared that the value of the land to be granted to the Illinois Central exceeded that of the riparian rights. Objections were also made by property holders along the line of the railway, who declared that it would allow the road to establish freight yards on the lake front and who thought the contract ought to have included a requirement that the railway adopt electric traction.

Southern Pacific Land Company.

President Sproule, Vice-president McCormick and other officers of the Southern Pacific have organized the Southern Pacific Land Company, with a capital of $5,000,000, the purpose of which is to simplify the land transactions of the road and obviate the necessity of referring everything to the general offices in New York. As soon as the preliminaries of organization have been completed 300 deeds of sale, involving large tracts, will be made. The move is solely for convenience and there is no new project in hand for exploitation.

Train Robbery on the Rock Island.

The Chicago, Rock Island & Pacific train 43 was held up by masked robbers on February 7 near Hurlburt, Ark. Train 43 left Memphis a few minutes after midnight. At Bridge Junction, where all trains stop for signals before starting out on the main line, the robbers boarded the train, crawled over the tender and covered the engine crew with their guns. After looting the combination mail and express car the robbers escaped. The passengers were not molested. The robbers detached the mail and express car and engine, and after binding and gagging the engineer and kicking him into a ditch forced the fireman to run them several miles down the track, where they blew up the safes.

In escaping the robbers cut the telegraph wires. When officers started on the trail this morning they found tracks of horses, and it is thought that the robbers escaped on horseback.

Agency for Railway Age Gazette Books.

The McGraw-Hill Book Company, New York, now has the exclusive sales agency for the technical books of the *Railway Age Gazette*, the *American Engineer* and *The Signal Engineer*. This makes the McGraw-Hill Book Company publishers and distributors of books for the three journals, but it does not affect the publication of the papers themselves in any way.

With the addition of these three papers in the railway field, the McGraw-Hill Company now publishes books for the twelve leading American engineering papers in the fields of civil, mechanical and electrical engineering, electric and steam railroading, machine tools, mining, metallurgy, chemical engineering, etc.

Missouri Pacific Mikado Locomotive.

In the description of the Missouri Pacific mikado locomotives in the *Railway Age Gazette* of January 12, the superheating surface shown in the table on page 57 was that given by the builders, but it has since been found that the superheating surface of the Illinois Central engines was figured on the outside of the tubes, while that of the Missouri Pacific was figured on the inside. The figures showing the superheating surface on the inside of the tubes are as follows:

Missouri Pacific	558 sq. ft.
Illinois Central	860 sq. ft.

Aileen Martin.

This is the name of a girl seven years old, daughter of the track foreman of the Southern Pacific at Alta, Cal., who on Saturday, January 13, discovered a broken rail and took action which led to the stopping of the Overland Limited express; and the Southern Pacific Company sent her a letter of thanks and a hundred dollars in money. A similar sum was given also to Alma Martin, sister of Aileen, and 14 years old, who assisted her.

The smaller girl, on discovering the rail, and knowing that the train would soon be due, ran into the section house and tried to telephone the information to the station agent; while doing so, the elder sister happened in, and told the agent of the child's story. The agent told Alma that the train had already entered the block section, and to flag it. The girls did this; and Superintendent H. W. Sheridan, on learning the facts, recommended the giving of a reward.

Alta is between Dutch Flat and Towle, 68 miles east of Sacramento. This is the section of line on which the electric train staff is in use, and therefore, presumably, there was no electric circuit in the track where the break occurred.

Improvements for the Wabash.

An extensive programme of improvements for the Wabash involving an expenditure of approximately $7,500,000 has been outlined by the receivers, F. A. Delano, W. K. Bixby and E. B. Pryor, to be carried out principally during the present year, and has been approved by the various courts having jurisdiction over the receivership. The plans are based on recommendations which were made by President Delano four years ago, and it is the belief of the receivers that the expenditure will bring a very handsome return either in increasing the capacity of the road or in diminishing the cost of operation, or both. The cost of the improvements has been provided for by the sale of $10,000,000 of 18-months receivers' certificates to Kuhn, Loeb & Company, under a plan by which $3,000,000 has been made available at once and the remainder will be paid in instalments during the year.

Approximately $3,525,000 of the amount authorized is to be expended for new equipment, which, it is expected, may be delivered in time for the road to have the benefit of it by July 1. This is in addition to an order for 25 locomotives placed last August and now being filled.

The programme also includes an expenditure of $2,954,500 for 180.8 miles of new second track. The proposed double-tracking will increase the capacity of the line in and out of all important terminals, and when it is completed will give the Wabash a double-track line from Lodge, Ill., to St. Louis, Mo., leaving only 116 miles of single track on the Chicago-St. Louis line. The double-track south of Chicago will be extended five miles from Worth to Orland, and east of Chicago five miles from Clarke Junction to Gary, Ind. The double-track work, with the exception of the section between Worth and Orland, which involves grade reduction and line revision, is expected to be completed during the coming summer.

A large amount of new rail is to be provided for renewals on the Chicago-St. Louis line for the purpose of bringing this line as rapidly as possible up to a standard of 100-lb. rail. On other portions of the line the double-tracking will be done with 90-lb. rail.

Most of the block signaling will be installed in Indiana to comply with the state law, and some additional installations will be made to protect short sections of the line in the vicinity of important terminals.

The complete list of expenditures authorized is as follows:

New Equipment.

	Estimated Cost.	
30 additional engines	$600,000	
1,000 steel underframe, 36-ft. and 40-ft., 80,000 lbs. capacity stock cars	850,000	
750 40-ft., 80,000 lbs. capacity automobile cars	675,000	
1,000 steel underframe, 36-ft., 40-ton box cars	900,000	
200 steel hopper cars, 50 tons capacity	200,000	
20 passenger train cars	300,000	
		$3,525,000

Second Track Work.

	Miles.	Estimated Cost.	
Oakwood to Romulus, Mich	11	$134,000	
Montpelier to Alvordton, O	11	146,000	
Decatur to Knights, Ill. (With gauntlet on bridge over Sangamon river.)	3	46,000	
Taylorville to Litchfield, Ill	32.5	552,500	
Clarke Junction to Gary, Ind	5	51,000	
Worth to Orland, Ill	5	370,000	
Bement to Lodge, Ill	13	208,000	
Bement to Tolono, Ill	13	170,000	
Fairmont to Danville, Ill	11	143,000	
Danville, Ill., to State Line, Ind	5	65,000	
Poag to Worden, Ill	15	210,000	
Moberly to Clark, Mo	11.3	147,000	
Moberly to Huntsville, Mo	6	84,000	
Brunswick to Salisbury, Mo	18	288,000	
Excelsior Springs Jct. to Birmingham, Mo	14	237,000	
Ft. Wayne to New Haven, Ind	5	73.000	
Ft. Wayne to Hugo, Ind	2	30,000	
Total miles of second track work proposed	180.8		2,954,500

Miscellaneous Items.

	Escimated Cost.	
Track elevation work in Ft. Wayne, Ind., completing work already begun, and required by ordinance to be completed within two years	$125,000	
Block signaling and telephone despatching, part of which is required by law of Indiana	150,000	
Replacing bridges or strengthening existing bridges, first year	100,000	
Miscellaneous industry sidings and passing tracks	150,000	
Delray (Mich.) engine house—property, buildings and appurtenances	75,000	
On account of miscellaneous improvements already in course of progress, authorized under the old management, not completed or paid for	250,000	
Machine tools, various shops	100,000	
New rail for replacement on Chicago-St. Louis line, 100-lb. rail being suggested, in order to bring the track up to the condition of that of best competitors; 10,000 tons, or, say, $300,000. Of this amount, $60,000 will be chargeable as a betterment, and carried to capital account	60,000	
		1,010,000
Grand total		$7,489,500

It is understood that arrangements for beginning the work and purchasing the equipment will be made at once.

Committee on Railway Mail Pay.

The chairman of this committee is A. W. Sullivan, recently general manager of the Missouri-Pacific, who has been elected to that position by a unanimous vote of the committee. His office will be at 75 Church street, New York City. Mr. Sullivan will devote his time exclusively to this work, and will relieve Mr. Kruttschnitt, the former chairman, and Mr. Peters, the former vice-chairman, from the labors connected with the work; but they will continue to act as members of the committee. Mr. Sullivan is widely known, having served three terms as president of the American Railway Association. He was formerly general manager of the Illinois Central.

The committee on Railway Mail Pay represents more than 208,000 miles of road, and was organized for the purpose of bringing about a readjustment of the present basis of pay for the transportation of the mails, under which the carriers claim that they are heavy losers. In his last report the postmaster general submitted a tentative draft of a proposed law for the regulation of railway mail pay which the carriers considered so drastic that Mr. Kruttschnitt shortly before his retirement as chairman of this committee addressed a letter to the Speaker of the House at Washington, asking that ample time be given for a detailed analysis of the report, and asserting that the figures were distorted, the results illogical and unwarranted and that the principle adopted by the postmaster general, if applied to all the business of the railways, would reduce them to bankruptcy.

Mr. Sullivan will make his headquarters in New York, but a considerable part of his time will be spent in Washington.

The Cleveland Engineering Society.

At the regular meeting of the Cleveland Engineering Society, to be held on February 13, a paper on Public Utilities and Their Relation to the Public will be presented by Mortimer E. Cooley, chairman of the Block Signal and Train Control Board. At the special meeting of this society to be held February 27, an illustrated paper will be presented on Technical Education by Prof. F. J. Barker, principal of the Technical High School, Cleveland, Ohio.

American Society of Civil Engineers.

At the meeting of the American Society of Civil Engineers, to be held on February 7, a paper by Frederick C. Noble, M. Am. Soc. C. E., entitled Notes on a Tunnel Survey, will be presented for discussion and illustrated with lantern slides. This paper was printed in the *Proceedings* for December, 1911.

MEETINGS AND CONVENTIONS.

The following list gives names of secretaries, dates of next or regular meetings, and places of meeting.

AIR BRAKE ASSOCIATION.—F. M. Nellis, 53 State St., Boston, Mass.; annual, May 7-10, Richmond, Va.

AMERICAN ASSOCIATION OF DEMURRAGE OFFICERS.—A. G. Thomason, Boston, Mass.; annual, May 10-11, San Francisco, Cal.

AMERICAN ASSOCIATION OF GENERAL PASSENGER AND TICKET AGENTS.—W. C. Hope, New York; next convention, Seattle, Wash.

AMERICAN ASSOCIATION OF FREIGHT AGENTS.—R. O. Wells, East St. Louis, Ill.; annual, June 18-21, Chicago.

AMERICAN ASSOCIATION OF RAILROAD SUPERINTENDENTS.—O. G. Fetter, Carew building, Cincinnati, Ohio; 3d Friday of March and September; annual, March 17, Chicago.

AMERICAN ELECTRIC RAILWAY ASSOCIATION.—H. C. Donecker, 29 W. 39th St., New York.

AMERICAN ELECTRIC RAILWAY MANUFACTURERS' ASSOC.—George Keegan, 165 Broadway, New York. Meetings with Am. Elec. Ry. Assoc.

AMERICAN RAILWAY ASSOCIATION.—W. F. Allen, 75 Church St., New York.

AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—C. A. Lichty, C. & N. W., Chicago. Convention, 3d week in Oct., Baltimore, Md.

AMERICAN RAILWAY ENGINEERING ASSOCIATION.—E. H. Fritch, Monadnock Block, Chicago; annual convention, March 19-21, 1912, Chicago.

AMERICAN RAILWAY MASTER MECHANICS' ASSOC.—J. W. Taylor, Old Colony building, Chicago. Convention, June 17-19, Atlantic City, N. J.

AMERICAN RAILWAY TOOL FOREMEN'S ASSOCIATION.—M. H. Bray, N. Y., N. H. & H., New Haven, Conn.

AMERICAN SOCIETY FOR TESTING MATERIALS.—Prof. E. Marburg, University of Pennsylvania, Philadelphia, Pa.

AMERICAN SOCIETY OF CIVIL ENGINEERS.—C. W. Hunt, 220 W. 57th St., New York; 1st and 3d Wed., except June and August, New York.

AMERICAN SOCIETY OF ENGINEERING CONTRACTORS.—J. R. Wemlinger, 13 Park Row, New York; 2d Tuesday of each month, New York.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—Calvin W. Rice, 29 W. 39th St., New York.

AMERICAN WOOD PRESERVERS' ASSOCIATION.—F. J. Angier, B. & O., Baltimore, Md. Convention, 3d week in January, 1913, Chicago.

ASSOCIATION OF AMERICAN RAILWAY ACCOUNTING OFFICERS.—C. G. Phillips, 143 Dearborn St., Chicago; annual, June 26, 1912, Quebec, Que.

ASSOCIATION OF RAILWAY CLAIM AGENTS.—J. R. McSherry, C. & E. I., Chicago; annual convention, May 22, 1912, Los Angeles, Cal.

ASSOCIATION OF RAILWAY ELECTRICAL ENGINEERS.—Jos. A. Andreucetti, C. & N. W. Ry., Chicago.

ASSOCIATION OF RAILWAY TELEGRAPH SUPERINTENDENTS.—P. W. Drew, 135 Adams St., Chicago; annual, June 24, 1912, New York.

ASSOCIATION OF TRANSPORTATION AND CAR ACCOUNTING OFFICERS.—G. P. Conrad, 75 Church St., New York.

CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk Ry., Montreal, Que.; 2d Tuesday in month, except June, July and Aug., Montreal.

CANADIAN SOCIETY OF CIVIL ENGINEERS.—Clement H. McLeod, 413 Dorchester St., Montreal, Que.; Thursdays, Montreal.

CAR FOREMEN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 841 North 50th Court, Chicago; 2d Monday in month, Chicago.

CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York; 2d Thurs. in Jan. and 2d Fri. in March, May, Sept., Nov., Buffalo, N. Y.

CIVIL ENGINEERS' SOCIETY OF ST. PAUL.—L. S. Pomeroy, Old State Capitol building, St. Paul, Minn.; 2d Monday, except June, July, August and September, St. Paul.

ENGINEERS' SOCIETY OF PENNSYLVANIA.—E. R. Dasher, Box 704, Harrisburg, Pa.; 1st Monday after 2d Saturday, Harrisburg, Pa.

ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—E. K. Hiles, 803 Fulton building, Pittsburgh; 1st and 3d Tuesday, Pittsburgh, Pa.

FREIGHT CLAIM ASSOCIATION.—Warren P. Taylor, Richmond, Va.; annual, May 15, Buffalo, N. Y.

GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.—E. S. Koller, 226 W. Adams St., Chicago; Wed. preceding 3d Thurs., Chicago.

INTERNATIONAL RAILWAY CONGRESS.—Executive Committee, rue de Louvain, 11 Brussels; 1915, Berlin.

INTERNATIONAL RAILWAY FUEL ASSOCIATION.—D. B. Sebastian, La Salle St. Station, Chicago. Convention, May 22-25, Chicago.

INTERNATIONAL RAILWAY GENERAL FOREMEN'S ASSOCIATION.—L. H. Bryan, Brown Marx building, Birmingham, Ala. Convention, July 23-26, Chicago.

INTERNATIONAL RAILROAD MASTER BLACKSMITHS' ASSOCIATION.—A. L. Woodworth, Lima, Ohio. Convention, August 15, Chicago.

MASTER BOILER MAKERS' ASSOCIATION.—Harry D. Vought, 95 Liberty St., New York; annual convention, May 14-17, Pittsburgh, Pa.

MASTER CAR BUILDERS' ASSOCIATION.—J. W. Taylor, Old Colony building, Chicago. Annual convention, June 12-14, Atlantic City, N. J.

MASTER CAR AND LOCOMOTIVE PAINTERS' ASSOC. OF U. S. AND CANADA.—A. P. Dane, B. & M., Reading, Mass. Convention, 2d week in September.

NATIONAL RAILWAY APPLIANCES ASSOC.—Bruce V. Crandall, 537 So. Dearborn St., Chicago. Meetings with Am. Ry. Eng. Assoc.

NEW ENGLAND RAILROAD CLUB.—G. H. Frazier, 10 Oliver St., Boston, Mass.; 2d Tuesday in month, except June, July, Aug. and Sept., Boston.

NEW YORK RAILROAD CLUB.—H. D. Vought, 95 Liberty St., New York; 3d Friday in month, except June, July and August, New York.

NORTHERN RAILROAD CLUB.—C. L. Kennedy, C., M. & St. P., Duluth, Minn.; 4th Saturday, Duluth.

OMAHA RAILWAY CLUB.—H. H. Maulick, Barker Block, Omaha, Neb.; second Wednesday.

RAILROAD CLUB OF KANSAS CITY.—C. Manlove, 1008 Walnut St., Kansas City, Mo.; 3d Friday in month, Kansas City.

RAILWAY BUSINESS ASSOCIATION.—Frank W. Noxon, 2 Rector St., New York.

RAILWAY CLUB OF PITTSBURGH.—J. B. Anderson, Penna. R. R., Pittsburgh, Pa.; 4th Friday in month, except June, July and August, Pittsburgh.

RAILWAY ELECTRICAL SUPPLY MANUFACTURERS' ASSOC.—J. Scribner, 1021 Monadnock Block, Chicago. Meetings with Assoc. Ry. Elec. Engrs.

RAILWAY GARDENING ASSOCIATION.—J. S. Butterfield, Lee's Summit, Mo.; next meeting, August 13-16, Roanoke, Va.

RAILWAY INDUSTRIAL ASSOCIATION.—G. L. Stewart, St. L. S. W. Ry., St. Louis, Mo.; annual, May 12, 1912, Kansas City, Mo.

RAILWAY SIGNAL ASSOCIATION.—C. C. Rosenberg, Bethlehem, Pa. Next meeting, March 18, Chicago.

RAILWAY STOREKEEPERS' ASSOCIATION.—J. P. Murphy, Box C, Collinwood, Ohio. Convention, May 20-22, Buffalo, N. Y.

RAILWAY SUPPLY MANUFACTURERS' ASSOC.—J. D. Conway, 2135 Oliver Bldg., Pittsburgh, Pa. Meetings with M. M. and M. C. B. assocs.

RAILWAY TEL. & TEL. APPLIANCE ASSOC.—W. E. Harkness, 284 Pearl St., New York. Meetings with Assoc. of Ry. Teleg. Sups.

RICHMOND RAILROAD CLUB.—F. O. Robinson, Richmond, Va.; 2d Monday, except June, July and August.

ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.—L. C. Ryan, C. & N. Y., Sterling; September, 1912, Buffalo, N. Y.

ST. LOUIS RAILWAY CLUB.—B. W. Fraumenthal, Union Station, St. Louis, Mo.; 2d Friday in month, except June, July and Aug., St. Louis.

SIGNAL APPLIANCE ASSOCIATION.—F. W. Edmonds, 3868 Park Ave., New York. Meetings with annual convention Railway Signal Association.

SOCIETY OF RAILWAY FINANCIAL OFFICERS.—C. Nyquist, La Salle St. Station, Chicago.

SOUTHERN ASSOCIATION OF CAR SERVICE OFFICERS.—E. W. Sandwich, A. & W. P. Ry., Montgomery, Ala.

SOUTHERN & SOUTHWESTERN RAILWAY CLUB.—A. J. Merrill, Grant bldg., Atlanta, Ga.; 3d Thurs., Jan., March, May, July, Sept., Nov., Atlanta.

TOLEDO TRANSPORTATION CLUB.—J. G. Macomber, Woolson Spice Co., Toledo, Ohio; 1st Saturday, Toledo.

TRAFFIC CLUB OF CHICAGO.—Guy S. McCabe, La Salle Hotel, Chicago; meetings monthly, Chicago.

TRAFFIC CLUB OF NEW YORK.—C. A. Swope, 290 Broadway, New York; last Tuesday in month, except June, July and August, New York.

TRAFFIC CLUB OF PITTSBURGH.—D. L. Wells, Erie, Pittsburgh, Pa.; meetings monthly, Pittsburgh.

TRAIN DESPATCHERS' ASSOCIATION OF AMERICA.—J. F. Mackie, 7042 Stewart Ave., Chicago; annual, June 18, 1912, Louisville, Ky.

TRANSPORTATION CLUB OF BUFFALO.—J. M. Sells, Buffalo; first Saturday after first Wednesday.

TRANSPORTATION CLUB OF DETROIT.—W. R. Hurley, L. S. & M. S., Detroit, Mich.; meetings monthly.

TRAVELING ENGINEERS' ASSOCIATION.—W. O. Thompson, N. Y. C. & H. R., East Buffalo, N. Y.; August, 1912.

WESTERN CANADA RAILWAY CLUB.—W. H. Rosevear, P. O. Box 1707, Winnipeg, Man.; 2d Monday, except, June, July and August, Winnipeg.

WESTERN RAILWAY CLUB.—J. W. Taylor, Old Colony building, Chicago; 3d Tuesday of each month, except June, July and August.

WESTERN SOCIETY OF ENGINEERS.—J. H. Warder, 1735 Monadnock Block, Chicago; 1st Monday in month except July and August, Chicago.

Traffic News.

The Chicago Railroad Association, which compiles the Chicago joint passenger rate sheet, has elected J. D. Lanigan, assistant general passenger agent of the Illinois Central, as chairman for the ensuing year, and W. E. Cooper, as secretary and treasurer.

The Rock Island "cream and egg special" train recently completed a five days' trip from St. Louis to Kansas City, making stops at thirty towns. It is estimated that a total of 15,000 persons attended the lectures, which were given by H. M. Cottrell, agricultural commissioner of the Rock Island Lines, and by professors of the agricultural college of the University of Missouri and members of the state board of agriculture.

The agricultural activities of the Southern Railway have now been extended to the poultry department, and a circular has been issued showing the prospective profits waiting for anyone who will go into the business of raising chickens in the southern states. Every southern city of any size imports every year thousands of dollars worth of eggs and chickens; and the average price of eggs throughout the year is 5 cents a dozen more than in the north.

The fifth annual dinner of the Traffic Club of Chicago is to be held on Tuesday evening, February 20, in the banquet room of the Hotel LaSalle. John Barton Payne, general counsel of the Chicago Great Western, will be toastmaster, and the speakers will be: Orrin R. Carter, chief justice of the Supreme Court of Illinois, Dr. Emil G. Hirsch, Sinai Congregation, Chicago, and James Albert Green, president Mathew Addy Company, Cincinnati.

The Transcontinental Passenger Association has issued a joint passenger tariff containing second-class one-way colonist fares to points in Alberta, Arizona, British Columbia, California, Colorado, Idaho, Mexico, Montana, Nevada, New Mexico, Oregon, Saskatchewan, Texas, Utah, Washington and Wyoming. The rates will be in effect March 1 to April 15 inclusive. From Chicago the one-way fare is $33, from St. Louis, $32, and from Kansas City, $25.

The West Jersey & Seashore, acting on the dictum of the Interstate Commerce Commission that an undercharge is a violation of law, and that consignees must be sued, if necessary, to secure full legal payment of freight charges, has notified a large number of consignees that various sums, from 10 cents to 50 cents, must be paid, some of these notices having to do with transactions several years in the past. In one instance it is said a suit has been brought against a consignee for 30 cents—24 cents principal and 6 cents interest.

The Minister of Agriculture, Province of Saskatchewan, has telegraphed to Washington from Regina, stating that there are 20,000,000 bushels of unthreshed wheat, all tough, and 12,000,000 bushels, wet and tough, in that Province, which must be shipped at once or be a total loss; and, the Canadian railways refusing to send their cars across the line, he seeks the co-operation of our government in bringing to bear such influence as may be practicable to induce the railways to provide the needed cars. The Interstate Commerce Commission, some weeks since, authorized the establishment of special rates on wheat and oats from points in Canada to Duluth and Minneapolis, waiving the thirty-day requirement.

The elevated railways carrying passengers from Manhattan, New York City, over the Brooklyn Bridge and thence to Coney Island, about 9 miles, announce that, beginning March 1, round trip tickets will be sold for 10 cents, or one-half the regular rate, to passengers leaving Coney Island between 6 and 9 a. m., and returning from Manhattan between 4 and 7 p. m. A similar reduction will be made to school children, the tickets to be available at the hours before the beginning and after the ending of the school sessions. From May 15 to September 15, the 10-cent round-trip tickets will be available for women and children going from Manhattan to the seashore, the southward trip to be begun between 6 and 9 a. m., and the return between 2 and 4:30 p. m.; but these will not be available on holidays or Sundays. During the hours in which reduced rates are granted the elevated now has comparatively light traffic.

Panama Canal Problems.

Professor Emory R. Johnson, of the University of Pennsylvania, testifying before a congressional committee at Washington last week, gave his views as to probable changes in ocean freight routes after the opening of the Panama Canal. The price of coal at different seaports is an important element in the relative economy of transportation by different ocean routes, and Professor Johnson thinks that in this respect the Panama route will have a marked advantage over routes through the Suez Canal. He estimates that, at the Atlantic end of the Panama Canal, Pocahontas coal will cost about $4.50 a ton; at the Suez Canal at present coal costs from $5.10 to $5.35. A ship of 3,000 tons, going from New York to Japan and back through the Suez Canal, will use $20,868 worth of fuel; the same ship through the Panama Canal would have to use $18,222 worth. This gives the Panama Canal an advantage of about $1 per net ton of registered tonnage.

W. A. Ring, chairman of a special committee of the New York Chamber of Commerce, which has been investigating the probable conditions surrounding traffic through the Panama Canal, recommends that the Chamber favor one dollar a ton as the rate of toll to be charged on all tonnage passing through the canal. To comply with the Clayton-Bulwer treaty of 1850, and with the Panama treaty of 1903, the United States government must charge the same tolls on American vessels as on those of Great Britain. The Commissioner of Navigation has published this same conclusion. Mr. Ring further says:

"The question as to what would be a fair rate of toll is most difficult to determine. When the Suez Canal was first opened the rate was about $3 per registered ton, but with the constant increase in business it has been gradually reduced, until for 1912 it will be $1.30 per ton. As the cost of the Suez Canal was only $125,000,000, the yearly profit has been very large. It would be impossible to determine in advance at all closely the volume of tonnage that will pass through the Panama Canal. Trade conditions will no doubt be changed to a considerable extent, and possibly to a large degree after the canal is opened and in use. It is doubtful whether the Panama Canal will be used ultimately to as large an extent as the Suez Canal. It is a lock canal and its operation for large steamships is still a problem that will be solved only by actual experience. Trade for North American and South American ports will no doubt avail very largely of the Panama Canal. As regards trade for the Far East, it is somewhat problematical, as the distances across the Pacific are very great, necessitating a large portion of the steamship's room being taken for coal, there being so few coaling stations in the Pacific. This will add materially to the cost of Far East voyages to China, Japan, the Philippines, Australia and New Zealand.

"Professor Emory R. Johnson has, we understand, increased his estimate from 7,000,000 tons up to 8,000,000 tons, that will pass through the canal at an early period after its completion, and it is his opinion that a toll rate of $1 per ton would produce the largest revenue for the canal.

"The nearest estimates of cost of interest and operation the committee has been able to secure, and a portion of these are largely problematical, are as follows:

Yearly cost of interest on bonds issued for construction of the canal, about	$11,000,000
Yearly cost of upkeep of the canal for improvements, repairs, contingencies and labor for operation	3,500,000
Total cost per year, which does not include provision for amortization of bonds	$14,500,000

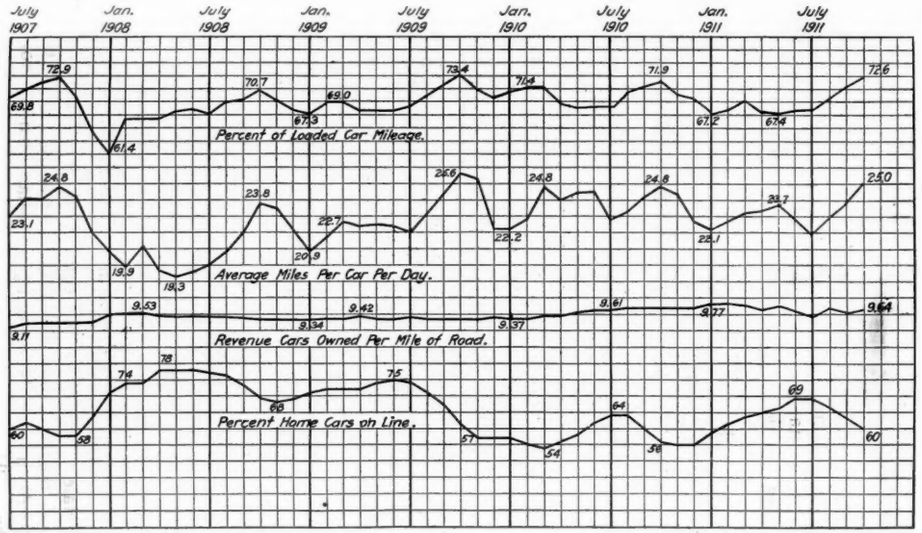
"On the basis cost per annum of $14,500,000 and tonnage carried of 8,000,000 tons, it would make the cost per ton $1.82. This cost is high and would no doubt be a handicap in making best and fullest use of the canal. Your committee is disposed to recommend a lower rate with the view of attracting a much larger volume of tonnage and thereby increasing the revenues of the canal."

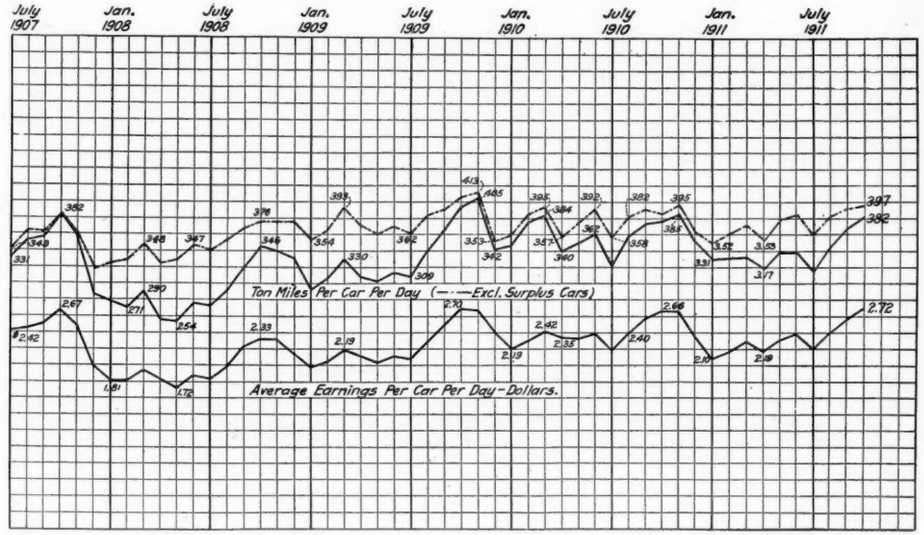
The toll of $1 a ton on all tonnage passing through the canal is the rate accordingly proposed.

Freight Car Balance and Performance.

Arthur Hale, chairman of the committee on relations between railways of the American Railway Association, in presenting statistical bulletin No. 114, covering car balance and performance for October, 1911, says:

"The majority of the performance averages show an improve-





Car Performances and Car Earnings and Mileage.

CAR BALANCE AND PERFORMANCE IN OCTOBER, 1911.

	New England.	N. Y., N. J., Del., Md., Eastern Pa.	Ohio, Ind., Mich., Western Pa.	Va., W. Va., No. and So. Carolina.	Ky., Tenn., Miss., Ala., Ga., Fla.	Iowa, Ill., Wis., Minn.	Mont., Wyo., Neb., Dakotas.	Kan., Colo., Okla., Mo., Ark.	Texas, La., New Mex.	Ore., Idaho, Nev., Cal., Ariz.	Canadian Lines.	Grand Total.
Revenue freight cars owned	87,304	498,605	213,585	185,245	173,101	393,580	18,553	135,603	30,257	144,117	110,255	1,990,205
Average number of system cars on line	44,923	291,248	122,565	106,227	97,419	253,716	6,898	78,150	22,823	62,534	73,510	1,163,013
Railway-owned cars: Average foreign on line	50,001	172,883	95,347	64,183	66,365	141,480	12,485	57,323	27,967	59,314	44,200	791,548
Total Railway-owned cars on line	94,924	464,131	217,912	170,410	163,784	398,196	19,383	135,473	50,790	121,848	117,710	1,954,561
Excess	7,620	.....	4,327	.....	.....	4,616	830	.....	20,533	.....	7,455	.....
Per cent. of cars on line to total owned;												
Home	52	58	57	57	56	65	37	58	75	43	67	58
Foreign	57	35	45	35	38	36	67	42	92	41	40	40
All railways	109	93	102	92	94	101	104	100	167	84	107	98
Private cars on line	3,990	27,652	12,165	3,117	7,286	14,770	2,440	9,268	4,257	11,580	2,673	99,198
Total, all cars on line	98,914	491,783	230,077	173,527	171,070	412,966	21,823	144,741	55,047	133,428	120,383	2,053,759
Per cent. of cars in shop	6.96	7.31	8.25	5.76	7.91	6.37	5.96	7.32	4.91	5.66	7.50	6.96
No. of freight engines owned	1,423	7,745	3,072	3,133	2,698	6,437	525	2,661	785	2,699	2,151	33,329
Average cars on line per freight engine owned	70	63	75	55	63	64	42	54	70	49	56	62
Total freight-car mileage	58,083,298	543,225,497	158,724,057	131,329,592	119,246,156	337,872,208	33,534,869	101,558,158	41,050,543	127,652,161	106,884,632	1,759,161,171
Average miles per car per day	18.9	24.1	22.2	24.4	22.5	26.4	49.6	23.9	24.1	30.9	28.6	25.0
Per cent. loaded mileage	74.6	71.1	71.8	69.1	73.7	72.7	69.8	73.6	73.0	74.9	80.8	72.6
Ton-miles of freight, including company freight	677,184,583	8,862,083,399	2,493,212,218	2,108,782,074	1,675,696,696	3,701,341,018	467,164,582	1,402,799,883	403,346,864	1,850,483,786	1,668,036,608	25,310,131,711
Average ton-miles, including company freight:												
Per car-mile	11.7	15.3	16.7	16.1	14.2	14.4	14.3	13.8	12.5	14.7	15.7	15.3
Per loaded car-mile	15.6	22.9	23.2	23.3	19.3	20.0	20.5	18.9	17.0	19.6	19.5	21.1
Per car per day	221	414	375	394	320	369	736	330	312	453	449	382
Gross freight earnings	$7,443,145	$37,813,308	$15,050,828	$13,070,467	$12,449,157	$36,122,752	$3,794,872	$12,944,663	$5,051,691	$18,132,561	$11,217,864	$173,094,308
Average daily earnings: Per car owned	$2.75	$2.45	$2.27	$2.28	$2.32	$2.96	$6.60	$3.08	$5.39	$4.06	$3.30	$2.81
Per railroad car on line	2.53	2.63	2.23	2.47	2.45	2.93	6.32	3.08	3.21	4.80	3.09	2.86
All cars on line	2.43	2.48	2.11	2.43	2.35	2.82	5.61	2.88	2.96	4.38	3.02	2.72

ment over the preceding month, and when compared with the averages of one year ago, show a typical October performance.

"There was a marked outward movement of cars during the month, the per cent. of cars on their home line falling from 64 in September, 1911, to 58 in October, 1911. As usual in such a movement, there was a decided increase in the loaded car mileage, the per cent. reaching 72.6, the highest since October, 1909.

"The tons per loaded car show a slight decrease, while the tons per car per day increased 14 tons for all cars and 5 tons excluding surplus cars. The earnings per car increased from $2.57 in September, 1911, to $2.72 in October, 1911, indicating the increased tons per car per day."

The accompanying table gives car balance and performance in the month covered by the report, and the two diagrams show car earnings and car mileage and certain car performance figures monthly from July, 1907.

Winter Experiences.

The Boston & Maine reports that more than 2,500 cars are overdue, some of them since January 6, at Rotterdam Junction, N. Y., its western terminus. The delays are largely due to the cold weather.

Hearing on the Western Classification.

A four-day hearing before G. N. Brown, chief examiner, and J. M. Jones, chief of the tariff bureau, of the board of suspension of the Interstate Commerce Commission, on the petition of the railway commissioners of nine states and a large number of shippers, for a suspension of Western Classification No. 51 for 120 days, was concluded at Chicago on January 29. After the hearing the commissioners and the National Industrial Traffic League sent a petition to Washington asking a hearing before the entire commission. The proceedings of the first two days of the hearing were reported in our last issue. Most of the complaints made by the shippers concerned advances in carload minimum weights and changes in descriptions of articles.

Walter E. McCormack, representing a number of machinery manufacturers, objected to a restriction of the mixing privileges on articles of machinery, contending that the new classification would prevent the mixing of woodworking and ironmaking machinery at carload rates. A representative of the Wisconsin paper makers objected to the classification on the ground that the mixing privilege was greatly restricted, and that advances were made in some paper items, while the reduction of the minimum weight on paper from 36,000 lbs. to 30,000 lbs., he said, was unimportant. R. C. Fyfe, chairman of the Western Classification Committee, explained that the reduction had been made for the sake of uniformity because in southern territory the higher minimum would be unreasonable, and that some of the paper items had been re-classified to prevent manipulation by shippers who had been billing finished stationery as flat paper. A manufacturer of wooden silos objected to an advance from class D to class B, declaring that silos represented little more than lumber, and that seven-eighths of the weight of the shipments would be lumber. Mr. Fyfe brought out that the addition of the hoops and doors made the difference between $250, the price for the size under discussion, and $40, the cost for carrying the lumber. It was agreed, however, in the interests of agriculture to restore the rating.

W. J. Evans, traffic manager of the National Association of Implement & Vehicle Manufacturers, objected to a rule cancelling the practice of advancing freight charges to jobbers of agricultural implements at distributing points, which, he said, had been a long-established custom. Chief Examiner Brown said the new rule had been inserted because the commission had held the advancing of charges to be a violation of law and subject to indictment. Several compromises were agreed to in the implement list.

After specific complaints had been presented on some 25 items, a number of the railway commissioners presented general arguments for a suspension of the entire classification. G. A. Henshaw, of the Oklahoma commission, protested because he had not received a copy of the classification until January 19. He said that the railways were trying to effect the advance in rates denied by the commission last year, and that the classification would increase their revenues by $20,000,000 to $40,000,000. Clifford Thorne, of the Iowa commission, acting as chairman of a committee of railway commissioners from Wisconsin, Minnesota, South Dakota, North Dakota, Missouri, Oklahoma, Iowa, Illinois and Kansas, declared that over 800 advances had been made, and that they should not be allowed to go into effect without a full hearing on each subject. He said the shippers had not been given sufficient notice and objected to the manner of hearing the shippers at the Milwaukee meeting of the Western Classification Committee last July, because it afforded no opportunity to cross-examine the representatives of the railways.

Examiner Brown said that the commission could only suspend for 10 months in any event, and that it desired evidence on particular items; but that if it were found that the railways were seeking to advance rates generally the commission would undoubtedly suspend the classification. He observed that thus far the commission has granted suspension in 74 cases and refused it in 200. He also said that some shippers had asked the commission not to suspend the classification.

Mr. Thorne introduced as a witness Rate Expert Bee of the Oklahoma commission, who said he had found 56 advances and 56 reductions in the first 38 pages of the classification. The advances, he said, were real, but he ridiculed the reductions as "paper." Mr. Fyfe in reply said that considering the entire volume of traffic affected, the reductions would far offset the advances, and showed by detailed statements that some of the reductions that did not affect Oklahoma affected an enormous volume of traffic elsewhere. He also showed that many of the changes in the classification are in the nature of requirements of proper packages and gave a physical demonstration in the case of a pail of fish, which had been submitted by a grocery firm, by breaking it with his fist. He said that the loss of brine would not affect either the shipper or the consignee of the fish, but would be reflected in claims for damage done to other articles in the car.

In the petition asking for a further hearing, complaint was made that the classification unduly favored the shippers of carload freight as against the small dealer.

Darius Miller, president of the Chicago, Burlington & Quincy, issued a statement explaining that the majority of the changes in the classification were due to the demand of the Interstate Commerce Commission for a uniform classification, and denying that it was the intent of the railways to effect an advance in rates.

On Monday the Western Classification Committee resumed its semi-annual meeting in Chicago pursuant to an adjournment at Galveston, Tex., on January 23, after having heard the shippers on the docket for the next issue of the Classification.

INTERSTATE COMMERCE COMMISSION.

The commission is to make a general investigation into alleged faulty and improper practices on the part of both railways and shippers in weighing freight, both carloads and less than carloads.

In connection with the general inquiry into the business of express companies, which was the subject of hearings at Washington last week, an examiner of the commission reported that in one month the Adams Express Company had imposed overcharges amounting to $67,000. Counsel for the express company explained that this sum was made up largely of "over prepayments," which were promptly adjusted, and that all employees were instructed to refund all discoverable overcharges. Commissioner Lane thought that the evidence showed the agents themselves to be very unfamiliar with the tariffs, 3,000 overcharges having been found in one day, and he said that the commission proposed to prosecute the company for making these overcharges, the same being clearly violations of the law. Evidence was submitted showing the great variations in the rates charged by express companies for different kinds of merchandise.

STATE COMMISSIONS.

The Pennsylvania commission has received from the Western Maryland a complaint against a new tariff which has been announced by the Philadelphia & Reading, making changes in freight rates from York, Hanover and Chambersburg to Philadelphia. It is declared that the new tariff will destroy legitimate competition.

REVENUES AND EXPENSES OF RAILWAYS.

MONTH OF DECEMBER, 1911.

Name of road.	Mileage operated at end of period.	Operating revenues			Operating expenses						Net operating revenue (or deficit).	Outside operations, net.	Taxes.	Operating income (or loss).	Increase (or decr.) comp. with last year.
					Maintenance										
		Freight.	Passenger.	Total, inc. misc.	Way and structures.	Of equipment.	Traffic.	Transportation.	General.	Total.					
Alabama & Vicksburg	142	$89,554	$49,289	$148,883	$17,773	$23,375	$3,285	$53,502	$4,896	$102,831	$46,052	—$727	$5,970	$39,355	—$25,013
Atchison, Topeka & Santa Fe	7,613	4,761,677	2,051,026	7,438,582	1,297,440	1,076,768	169,706	2,277,184	173,991	4,994,089	2,444,493	.....	259,696	2,184,797	—244,670
Atlanta, Birmingham & Atlantic	661	227,792	66,068	311,765	29,871	49,728	18,768	110,389	13,477	222,233	89,532	.....	15,750	73,782	2,888
Atlantic Coast Line	4,525	2,169,474	837,519	3,256,760	346,398	400,883	51,067	1,041,663	78,502	1,918,513	1,338,247	.....	107,000	123,247	37,627
Baltimore & Ohio—System	4,433	5,475,820	1,228,668	7,188,254	760,343	1,392,941	148,749	2,625,423	176,094	5,103,550	2,084,704	—55,739	221,495	1,807,470	536,154
Baltimore & Ohio Chicago Terminal	77	.....	1,745	110,301	22,792	16,479	909	64,983	3,659	108,822	1,479	872	18,206	—15,855	—4,033
Bangor & Aroostook	627	185,725	46,716	246,052	36,358	28,330	3,951	86,308	12,129	167,076	78,976	.....	9,250	69,726	—14,767
Bessemer & Lake Erie	203	392,469	24,748	425,403	58,692	121,222	7,837	151,043	25,013	363,807	61,596	.....	32,474	29,122	151,979
Boston & Maine	2,242	2,259,840	1,212,143	3,763,842	419,056	548,396	36,455	1,981,725	96,755	3,082,387	681,455	13,503	166,910	528,048	408,371
Buffalo & Susquehanna *R. R.*	265	145,761	9,281	159,644	20,480	27,762	2,007	61,423	6,490	118,162	41,482	.....	2,600	38,882	11,527
Buffalo & Susquehanna *Ry*	91	41,045	9,138	52,017	6,109	26,050	577	24,661	2,175	59,572	—7,555	—74	1,400	—9,029	9,739
Buffalo, Rochester & Pittsburgh	572	632,688	87,966	739,148	64,743	144,834	9,458	252,122	19,658	490,815	248,333	74	17,000	231,407	—40,751
Central of New Jersey	671	1,679,167	405,493	2,205,465	197,679	310,513	31,013	675,368	49,582	1,264,155	941,310	—7,940	102,651	830,719	62,562
Central New England	276	248,954	28,264	292,153	36,937	25,233	1,492	77,858	4,953	146,473	145,680	—345	9,000	136,335	14,976
Charleston & Western Carolina	340	128,034	38,201	175,973	28,957	24,661	3,178	65,760	6,091	128,647	47,326	.....	5,000	42,326	—31,570
Chesapeake & Ohio Lines	2,241	2,203,518	469,688	2,835,282	289,284	561,888	47,531	860,080	58,834	1,817,617	1,017,665	10,782	68,083	960,364	140,038
Chicago & Alton	1,025	727,708	352,525	1,175,881	125,340	261,661	39,976	474,397	36,098	937,472	238,409	—3,788	36,500	198,121	—61,582
Chicago & Eastern Illinois	1,275	995,048	256,125	1,354,080	109,903	271,900	30,722	526,711	41,437	980,673	373,407	—4,399	18,093	350,915	—93,592
Chicago & Northwestern	7,905	3,513,085	1,623,709	5,815,766	633,766	897,634	110,227	2,597,434	121,253	4,360,314	1,455,452	—10,233	275,000	1,170,219	—126,778
Chicago, Burlington & Quincy	9,074	4,552,930	1,735,315	6,942,257	581,505	1,187,738	128,934	2,286,977	188,748	4,373,902	2,568,355	—13,584	264,412	2,290,359	—20,736
Chicago Great Western	1,496	769,597	233,180	1,086,534	73,709	184,294	44,851	468,044	32,581	803,479	283,055	—114	33,038	249,903	—5,154
Chicago, Indiana & Southern	359	328,627	26,179	379,345	54,540	72,257	6,703	152,286	9,298	268,084	111,261	115	5,598	105,778	18,327
Chicago, Milwaukee & Puget Sound	2,058	1,103,950	221,191	1,370,707	79,026	160,324	48,037	526,136	30,283	843,806	526,901	14,008	79,334	461,575	—52,218
Chicago, Milwaukee & St. Paul	7,511	3,607,979	1,154,623	5,298,579	390,170	799,346	109,157	2,180,181	125,758	3,604,612	1,693,967	—2,721	243,674	1,447,572	458,172
Chicago, Peoria & St. Louis	255	94,498	28,697	130,048	17,623	27,127	6,933	62,502	6,665	120,850	9,198	.....	4,300	4,898	13,910
Chicago, Rock Island & Pacific	7,551	3,333,619	1,568,310	5,235,092	674,468	648,240	157,044	2,186,488	147,128	3,813,368	1,421,724	—30,529	232,981	1,158,214	—423,992
Chicago, St. Paul, Minneapolis & Omaha	1,743	806,148	379,087	1,283,189	88,489	147,733	30,048	545,028	28,824	840,122	443,067	—1,103	66,726	375,238	—17,793
Cincinnati, New Orleans & Texas Pacific	337	599,128	165,016	808,996	84,426	188,537	19,279	232,705	19,936	544,883	264,113	—663	21,800	241,650	—14,766
Cincinnati, Hamilton & Dayton	1,014	570,244	127,324	780,678	66,579	136,485	17,832	348,332	21,205	590,433	190,245	.....	45,285	144,960	15,160
Cleveland, Akron & Cincinnati	344	217,622	70,391	309,904	34,876	58,453	4,744	109,917	6,152	214,142	95,762	.....	18,000	77,762	2,985
Colorado Midland	337	99,247	16,354	133,973	14,972	31,792	7,449	63,855	5,379	123,447	10,526	—158	8,000	2,368	—12,210
Colorado & Southern	1,109	589,292	97,831	742,438	69,763	136,219	11,598	234,128	23,195	474,903	267,535	—1,042	29,200	237,293	—81,071
Cumberland Valley	162	174,551	54,452	241,264	44,426	30,685	3,778	79,921	11,596	170,406	70,858	346	10,784	60,420	—19,140
Delaware & Hudson Co.—R. R. Dept	851	1,495,740	205,019	1,753,629	91,778	155,528	18,083	580,066	46,824	892,279	861,350	1,090	57,821	804,619	184,131
Delaware, Lackawanna & Western	958	2,194,689	636,537	3,027,925	191,045	500,381	66,690	945,105	67,856	1,771,077	1,256,848	30,340	178,500	1,108,688	—93,695
Denver & Rio Grande	2,555	1,448,739	329,700	1,863,536	158,791	343,690	50,990	719,168	47,448	1,320,087	543,449	—5,505	78,000	459,944	—98,348
Denver, Northwestern & Pacific	214	82,105	10,755	97,566	11,092	20,517	1,854	46,099	3,116	82,678	14,888	.....	3,000	11,888	—2,433
Detroit, Toledo & Ironton	441	116,407	13,962	141,897	31,384	15,624	2,706	75,581	5,286	130,581	11,316	—10	3,000	8,306	30,442
Duluth & Iron Range	200	62,207	23,830	92,436	32,538	33,825	642	59,653	21,930	148,588	—56,152	—3,225	40,554	—99,931	53,303
El Paso & Southwestern Co	901	549,857	82,493	668,111	76,898	81,667	11,275	193,064	22,975	385,879	282,232	—4,662	29,030	248,540	23,492
Elgin, Joliet & Eastern	841	771,214	1	814,992	79,467	158,428	4,362	260,801	30,457	533,515	281,477	.....	34,988	246,489	146,507
Fort Worth & Denver City	454	294,608	129,117	444,462	42,181	71,305	6,509	151,788	15,126	286,909	157,553	—472	12,000	145,081	—69,054
Grand Rapids & Indiana	587	247,652	127,608	407,024	35,676	69,943	11,242	176,928	16,786	310,575	96,449	76	22,757	73,768	50,964
Great Northern	7,344	3,519,981	1,074,481	4,984,306	413,496	632,827	85,970	1,497,647	98,691	2,728,631	2,255,675	5,933	312,130	1,949,478	185,242
Gulf & Ship Island	307	117,064	35,513	168,258	15,657	26,937	2,206	52,109	9,685	106,594	61,664	.....	4,425	57,239	—7,520
Gulf, Colorado & Santa Fe	1,603	845,058	280,271	1,199,587	124,866	158,243	25,844	447,079	33,300	789,332	410,255	.....	39,055	371,200	—38,396
Illinois Central	4,755	3,147,165	1,208,065	4,975,001	505,062	1,298,548	121,358	2,065,498	132,818	4,123,284	851,717	—3,291	230,923	617,503	—987,674
Iowa Central	558	258,582	45,062	315,778	32,519	50,039	7,809	147,795	8,842	247,004	68,774	.....	9,635	59,139	—8,863
Indiana Harbor Belt	104	.....	.....	206,301	27,491	—4,730	2,627	105,164	6,016	136,568	69,733	283	+4,063	74,079	82,797
Kansas City Southern	827	555,639	140,680	787,722	76,931	125,310	26,348	271,431	31,820	531,840	255,882	.....	34,612	221,270	—72,085
Lake Shore & Michigan Southern	1,775	2,733,780	965,443	4,165,654	388,349	433,559	83,027	1,463,280	87,878	2,456,093	1,709,561	—4,756	118,939	1,585,866	884,858
Lehigh & Hudson River	96	137,082	3,764	142,171	11,109	18,444	1,535	54,557	9,504	95,149	47,022	.....	3,500	43,522	—5,968
Lehigh Valley	1,434	2,619,852	385,735	3,116,124	376,323	559,928	77,227	1,077,773	78,539	2,169,790	946,334	—59,379	124,600	762,355	—49,687
Long Island	398	257,972	439,718	737,549	93,411	103,591	14,187	395,401	25,340	631,930	105,619	49,350	53,554	101,415	102,456
Louisville & Nashville	4,704	3,230,367	1,112,126	4,655,837	654,396	794,468	106,299	1,534,686	90,394	3,180,243	1,475,594	1,806	148,950	1,328,450	—95,958

REVENUES AND EXPENSES OF RAILWAYS.

MONTH OF DECEMBER, 1911—(CONTINUED).

Name of road.	Mileage operated at end of period.	Operating revenues			Operating expenses						Net operating revenue (or deficit).	Outside operations, net.	Taxes.	Operating income (or loss).	Increase (or decr.) comp. with last year.
					Maintenance										
		Freight.	Passenger.	Total, inc. misc.	Way and structures.	Of equipment.	Traffic.	Transportation.	General.	Total.					
Louisville, Henderson & St. Louis	199	$62,488	$32,389	$101,576	$18,335	$19,469	$4,342	$35,899	$2,992	$81,037	$20,539	$253	$3,000	$17,792	—$783
Maine Central	1,179	500,184	234,443	789,542	104,208	123,925	8,940	317,511	36,356	590,940	198,602	35,373	44,259	189,716	92,820
Michigan Central	1,804	1,746,020	654,453	2,695,982	495,317	283,646	61,984	1,065,615	51,461	1,958,023	737,959	2,048	134,322	605,685	113,151
Minneapolis & St. Louis	1,027	239,316	98,118	370,265	46,380	51,908	11,092	167,018	12,710	289,108	81,157	—37	19,097	62,023	—28,222
Missouri, Kansas & Texas	1,744	912,944	414,904	1,401,317	82,248	185,668	36,644	476,536	39,766	820,862	580,455	—2,803	62,250	515,402	49,659
Missouri, Kansas & Texas of Texas	1,345	644,028	364,444	1,069,988	242,134	101,900	25,902	586,758	26,392	983,086	86,902	—12	38,626	48,264	—210,965
Missouri Pacific	3,915	1,330,199	393,563	1,894,525	259,805	304,146	56,242	970,820	73,223	1,664,236	230,289	—5,119	82,600	142,570	263,754
Mobile & Ohio	1,114	770,575	138,306	979,226	105,206	167,796	35,549	347,754	33,527	689,832	289,394	—971	26,130	262,293	—39,388
Monongahela	64	99,961	2,809	104,365	10,001	8,748	222	21,118	1,710	41,799	62,566	.....	3,730	58,836	11,672
Nashville, Chattanooga & St. Louis	1,255	630,378	258,113	959,195	138,589	191,404	34,800	356,976	26,086	747,855	211,340	—909	23,816	186,615	—70,519
New Orleans & North Eastern	195	247,627	59,823	330,980	26,952	63,120	8,216	125,646	11,346	235,280	95,700	—242	8,321	87,137	—28,650
New York Central & Hudson River	3,591	5,044,550	2,524,984	8,541,634	1,106,538	1,384,722	169,838	3,432,331	212,548	6,305,977	2,235,657	50,695	420,317	1,866,035	609,637
New York, Chicago & St. Louis	562	861,837	124,793	1,024,311	92,871	87,381	52,852	409,139	17,366	659,609	364,702	—2,089	+8,875	371,488	109,068
New York, New Haven & Hartford	2,091	2,634,326	2,233,555	5,418,045	480,606	630,138	27,243	2,148,758	168,477	3,455,222	1,962,823	122,907	310,000	1,775,730	513,785
New York, Ontario & Western	565	568,845	96,126	690,422	90,568	133,888	9,913	286,260	22,600	543,229	147,193	—464	17,917	128,812	—20,209
New York, Philadelphia & Norfolk	112	199,014	41,643	261,980	26,645	45,026	4,455	113,725	12,881	202,732	59,248	.....	7,500	51,748	—16,861
Norfolk & Western	2,004	2,767,585	379,388	3,257,245	347,751	631,619	58,199	984,884	70,650	2,093,103	1,164,142	—4,754	115,000	1,044,388	228,726
Norfolk Southern	607	172,050	79,701	270,251	26,088	33,671	5,482	90,755	13,868	169,864	100,387	—60	7,500	92,827	—521
Northern Central	473	760,172	192,354	1,024,812	56,149	238,952	15,670	532,768	26,369	869,708	155,104	280	40,337	115,047	55,209
Northern Pacific	6,018	3,744,724	1,158,350	5,253,317	481,854	564,906	100,857	1,771,901	83,495	3,003,013	2,250,304	83,743	262,666	2,071,381	380,908
Oregon Short Line	1,761	1,356,815	352,036	1,813,693	142,036	215,612	31,621	488,553	38,947	916,769	896,924	—482	247,659	648,783	—64,815
Oregon-Washington R. R. & Nav. Co.	1,919	808,335	378,063	1,283,994	136,725	160,455	41,845	504,065	47,163	892,253	393,741	6,001	165,000	234,742	.....
Pennsylvania *Co.*	1,415	2,825,580	735,737	3,945,120	562,315	728,708	73,087	1,519,889	94,400	2,978,400	966,720	—2,397	260,588	703,735	81,978
Pennsylvania *Railroad*	3,980	9,916,658	2,828,215	13,746,379	1,864,204	2,741,957	202,243	5,071,281	366,824	10,246,509	3,499,870	—180,997	605,931	2,712,942	795,142
Peoria & Eastern	351	209,769	64,443	294,352	20,284	35,116	4,624	113,410	5,827	179,261	115,091	.....	5,703	109,388	24,437
Pere Marquette	2,331	1,055,024	339,668	1,520,680	178,502	249,874	30,941	671,831	36,234	1,167,382	353,298	1,180	59,666	294,812	38,462
Philadelphia & Reading	1,014	3,212,397	575,955	3,952,912	249,295	685,844	36,843	1,233,906	64,224	2,270,112	1,682,800	35,236	90,316	1,627,720	146,625
Philadelphia, Baltimore & Washington	713	694,419	699,035	1,581,121	266,259	280,138	28,762	688,987	44,524	1,308,670	272,451	.....	50,698	221,753	—31,709
Pittsburgh & Lake Erie	215	1,040,475	127,422	1,208,360	138,649	216,237	12,907	326,385	25,415	719,593	488,767	—226	25,799	462,742	42,337
Pittsburgh, Cincinnati, Chic. & St. L.	1,467	2,203,812	703,574	3,288,972	404,937	620,012	66,955	1,266,519	68,840	2,427,263	861,709	—477	136,427	724,805	131,632
Richmond, Fredericksburg & Potomac	83	103,706	80,022	210,213	18,695	20,366	3,075	78,033	6,220	126,389	83,824	.....	1,094	82,730	10,695
Rutland	468	144,903	89,909	264,966	23,936	48,300	6,095	99,542	9,261	187,134	77,832	.....	10,894	66,938	6,836
St. Joseph & Grand Island	319	66,560	36,415	114,063	21,736	29,225	4,415	64,267	6,771	126,414	—12,351	—100	13,927	—26,378	—32,446
St. Louis, Iron Mountain & Southern	3,314	1,940,622	585,333	2,694,251	423,278	305,399	51,666	844,062	71,471	1,695,876	998,375	—11,933	83,615	902,827	227,836
St. Louis Merchants' Bridge Terminal	9	.....	317	134,507	24,883	13,464	430	80,982	4,945	124,704	9,803	.....	6,382	3,421	519
St. Louis, San Francisco & Texas	243	92,904	28,751	128,512	16,092	12,207	2,819	56,715	4,797	92,630	35,882	.....	716	35,166	25,429
St. Louis Southwestern	796	558,950	138,834	730,247	58,965	95,634	31,999	168,850	22,595	378,043	352,204	—726	25,406	326,072	10,162
Santa Fe, Prescott & Phoenix	364	83,912	37,817	129,660	19,636	11,907	3,363	38,955	6,117	79,978	49,682	.....	3,743	45,939	—9,107
Southern	7,088	3,524,779	1,610,583	5,607,472	631,445	780,037	132,738	1,879,286	176,942	3,600,448	2,007,024	8,945	234,775	1,781,194	79,758
Southern in Mississippi	280	69,586	42,005	120,235	20,805	7,960	2,664	41,299	4,071	76,799	43,436	.....	5,217	38,219	—23,224
Syracuse, Binghamton & New York	80	47,143	33,589	92,316	3,712	6,514	2,824	34,375	2,562	49,987	42,329	.....	6,220	36,109	9,938
Tennessee Central	293	78,693	34,564	120,053	22,795	18,358	5,122	44,599	7,525	98,399	21,654	.....	4,184	17,470	—15,914
Terminal R. R. Ass'n of St. Louis	35	.....	233	230,158	39,583	30,472	654	85,892	7,367	163,968	66,190	9,312	29,989	45,513	—24,094
Toledo & Ohio Central	440	337,636	51,170	406,050	98,316	51,425	6,370	136,357	8,396	300,864	105,186	—1,376	+1,719	105,529	—8,622
Toledo, Peoria & Western	247	62,038	39,851	106,915	20,110	24,938	2,329	41,310	3,590	92,277	14,638	.....	4,800	9,838	—12,963
Toledo, St. Louis & Western	450	276,366	40,286	336,757	30,984	63,237	7,592	124,902	9,562	236,277	100,480	.....	14,500	85,980	4,361
Union Pacific	3,537	2,755,919	813,503	3,925,656	290,414	622,629	122,034	1,234,650	113,149	2,382,876	1,542,780	—6,823	214,257	1,321,700	—450,087
Union R. R. of Baltimore	9	92,968	21,169	116,041	11,098	.....	1,049	5,346	2,869	20,362	95,679	.....	5,923	89,756	—13,176
Union R. R. of Pennsylvania	31	.....	.....	243,200	35,329	79,077	100	120,124	9,753	243,383	—183	4,892	19,323	—14,614	—68,989
Vandalia	827	518,590	201,187	843,966	105,983	153,446	24,997	340,346	18,225	642,997	200,969	.....	28,718	172,251	6,768
Vicksburg, Shreveport & Pacific	171	78,839	50,717	141,996	23,871	19,217	2,723	42,621	4,672	93,104	48,892	94	10,971	38,015	—11,428
Virginian	474	335,902	23,884	371,781	49,426	68,502	4,783	110,230	8,154	241,095	130,686	6,329	13,000	124,015	7,230
Washington Southern	35	32,753	39,504	96,734	10,744	9,556	1,246	37,441	3,170	62,157	34,577	.....	3,245	31,332	4,656
West Jersey & Seashore	355	225,039	207,773	460,538	70,371	91,733	19,363	218,242	11,516	411,225	49,313	—4,423	23,473	21,417	61,959
Yazoo & Mississippi Valley	1,371	733,488	276,315	1,073,550	131,311	147,558	16,517	402,377	25,775	723,538	350,012	1,719	37,982	313,749	—326,985

REVENUES AND EXPENSES OF RAILWAYS.

SIX MONTHS OF FISCAL YEAR, 1912.

Name of road.	Mileage operated at end of period.	Operating revenues			Operating expenses						Net operating revenue (or deficit).	Outside operations, net.	Taxes.	Operating income (or loss).	Increase (or decr.) comp. with last year.
					Maintenance										
		Freight.	Passenger.	Total, inc. misc.	Way and structures.	Of equipment.	Traffic.	Transportation.	General.	Total.					
Alabama & Vicksburg	142	$525,612	$271,609	$856,836	$127,306	$160,192	$22,386	$287,478	$31,062	$628,424	$228,412	—$1,124	$30,096	$197,192	—$80,476
Atchison, Topeka & Santa Fe	7,613[1]	29,763,511	11,599,906	44,888,410	7,418,772	6,856,328	952,321	12,927,371	960,255	29,115,047	15,773,363	.....	1,783,176	13,990,187	—2,052,822
Atlanta, Birmingham & Atlantic	661	1,232,997	372,503	1,690,864	173,506	268,942	100,031	599,849	60,755	1,203,083	487,781	.....	79,300	408,481	101,283
Atlantic Coast Line	4,525[2]	10,660,387	3,984,287	15,796,586	2,079,605	2,355,308	258,859	5,378,583	428,308	10,500,663	5,295,923	.....	642,000	4,653,923	209,612
Baltimore & Ohio—System	4,433[3]	35,981,558	8,122,895	46,922,384	5,901,911	8,367,277	967,304	15,839,874	982,424	32,058,790	14,863,594	—325,116	1,437,787	13,100,691	1,068,831
Baltimore & Ohio Chicago Terminal	77	.....	14,809	813,999	183,680	103,368	5,628	343,403	32,766	668,845	145,154	5,034	109,238	40,950	3,184
Bangor & Aroostook	627	1,221,257	356,060	1,669,486	279,455	191,963	24,185	497,014	70,135	1,062,752	606,734	.....	67,474	2,267,224	529,933
Bessemer & Lake Erie	203[4]	4,570,594	201,783	4,826,382	453,948	797,771	51,609	1,123,479	64,877	2,491,684	2,334,698	.....	55,500	551,234	49,043
Boston & Maine	2,244[5]	13,493,118	8,805,781	24,039,531	3,492,076	3,160,875	242,412	10,676,655	514,184	18,086,202	5,953,329	118,960	1,047,139	5,025,150	31,261
Buffalo & Susquehanna *R. R.*	265	840,748	58,313	930,934	181,393	169,733	9,155	339,722	38,298	738,301	192,633	.....	15,600	177,033	21,297
Buffalo & Susquehanna *Ry.*	91	258,011	63,072	383,854	38,407	160,572	3,113	141,111	14,966	358,169	—24,315	—348	8,400	—33,063	21,793
Buffalo, Rochester & Pittsburgh	572[6]	4,122,886	592,465	4,861,086	641,096	916,952	58,393	1,546,311	102,675	3,265,427	1,595,659	1,257	102,000	1,494,916	—278,983
Central of New Jersey	671[7]	9,730,724	3,011,046	13,435,430	1,373,611	1,859,173	191,528	3,815,934	244,453	7,484,699	5,950,731	134,281	574,070	5,510,942	890,689
Central New England	276	1,449,787	186,476	1,718,773	286,002	127,289	8,032	442,796	16,863	880,982	837,791	—244	54,000	783,547	191,385
Charleston & Western Carolina	340	741,855	201,616	994,692	177,742	135,430	17,820	343,097	26,187	700,276	294,416	.....	30,000	264,416	—3,014
Chesapeake & Ohio Lines	2,241[8]	13,399,943	2,995,611	17,083,916	2,179,116	3,223,145	306,914	5,000,696	369,763	11,079,634	6,004,282	24,393	508,567	5,520,108	27,250
Chicago & Alton	1,025	5,031,487	2,274,321	7,875,734	1,160,737	1,420,583	241,904	2,732,483	198,821	5,754,528	2,121,206	—18,436	219,000	1,883,770	—14,710
Chicago & Eastern Illinois	1,275	6,037,919	1,549,490	8,155,207	922,815	1,489,603	178,364	2,820,491	244,712	5,655,985	2,499,222	—14,901	210,593	2,273,728	—131,019
Chicago & Northwestern	7,905[9]	24,599,242	10,856,757	39,260,058	5,172,978	5,021,993	713,315	15,265,422	731,168	26,904,876	12,355,182	—4,424	1,650,000	10,700,758	—185,252
Chicago, Burlington & Quincy	9,074[10]	30,155,293	11,768,903	45,970,699	5,607,695	7,580,491	783,728	14,131,515	1,122,982	29,226,411	16,744,288	—55,344	1,586,508	15,102,436	—460,720
Chicago Great Western	1,496[11]	4,654,993	1,611,675	6,779,651	776,494	964,280	279,950	2,633,256	209,034	4,863,014	1,916,637	457	198,222	1,718,872	59,588
Chicago, Indiana & Southern	359[12]	1,704,615	165,528	1,949,766	280,174	398,069	44,859	695,781	50,423	1,469,306	480,460	1,976	75,099	407,337	103,255
Chicago, Milwaukee & Puget Sound	2,058[13]	6,691,038	1,462,010	8,423,869	542,715	832,610	315,450	3,997,340	119,700	4,807,815	3,616,054	123,414	476,005	3,263,463	—172,028
Chicago, Milwaukee & St. Paul	7,511	22,332,489	7,770,415	33,344,555	5,019,291	4,680,896	645,129	13,070,250	581,570	23,997,136	9,347,419	16,112	1,441,503	7,922,028	—913,091
Chicago, Peoria & St. Louis	255	632,127	195,301	871,525	113,067	174,327	43,530	375,417	35,740	742,081	129,444	.....	25,800	103,644	13,674
Chicago, Rock Island & Pacific	7,551[14]	20,507,828	10,045,845	32,603,468	4,986,500	4,301,086	939,877	12,478,565	840,258	23,546,286	9,057,182	—92,500	1,315,888	7,648,793	—1,381,205
Chicago, St. Paul, Minneapolis & Omaha	1,743	4,964,381	2,520,953	8,060,178	1,061,631	909,424	162,849	3,071,982	179,354	5,385,240	2,674,938	4,746	399,067	2,280,617	—649,424
Cincinnati, New Orleans & Texas Pacific	337	3,685,985	908,227	4,838,755	485,435	999,085	118,603	1,353,999	108,409	3,065,531	1,773,224	—2,972	130,800	1,639,452	—115,784
Cincinnati, Hamilton & Dayton	1,014	3,833,507	921,585	5,335,918	544,598	839,947	115,220	2,152,493	115,404	3,767,662	1,568,256	.....	244,124	1,324,132	218,560
Cleveland, Akron & Cincinnati	344	1,360,019	451,565	1,938,613	287,623	323,980	25,379	640,530	32,208	1,309,720	628,893	.....	116,200	512,693	8,259
Colorado Midland	337	807,371	160,605	1,061,596	130,201	189,259	43,435	435,082	32,227	830,204	231,392	—1,272	48,000	182,120	21,657
Colorado & Southern	1,109[15]	3,267,729	815,093	4,369,031	504,468	822,757	66,937	1,330,245	139,231	2,863,638	1,505,393	—5,939	152,700	1,346,754	—238,362
Cumberland Valley	162	1,070,462	359,205	1,500,047	261,872	183,371	27,788	470,569	47,391	990,991	509,056	2,832	36,491	475,397	—147,962
Delaware & Hudson Co.—R. R. Dept	851[16]	9,005,885	1,769,037	11,133,917	750,731	1,455,593	128,128	3,625,438	271,025	6,230,915	4,903,002	—5,760	302,789	4,594,453	349,694
Delaware, Lackawanna & Western	958[17]	13,828,829	4,161,104	19,174,316	2,331,288	2,948,193	392,709	5,521,045	390,479	11,583,714	7,590,602	239,252	1,001,000	6,828,854	—132,007
Denver & Rio Grande	2,555	9,216,639	2,870,359	12,619,258	1,794,714	2,123,538	330,635	4,340,990	293,109	8,882,986	3,736,272	2,284	442,000	3,296,556	—697,281
Denver, Northwestern & Pacific	214	440,263	208,373	677,783	84,202	94,272	14,803	219,324	18,875	432,476	245,307	.....	18,000	227,307	—824
Detroit, Toledo & Ironton	441	760,035	95,646	920,774	178,952	113,420	16,564	425,875	32,544	767,355	153,419	—23	37,584	116,812	64,112
Duluth & Iron Range	200[18]	4,232,502	134,079	4,423,402	555,994	330,826	5,313	749,804	74,177	1,716,114	2,707,288	14,668	215,070	2,506,886	—446,425
El Paso & Southwestern Co	901	2,922,991	473,929	3,585,225	463,318	502,257	71,891	999,474	136,077	2,173,017	1,412,208	—12,409	144,409	1,255,390	—109,527
Elgin, Joliet & Eastern	841[19]	4,685,214	.....	4,946,684	459,836	905,382	24,768	1,410,803	101,590	2,903,379	2,044,305	.....	118,613	1,925,692	662,286
Fort Worth & Denver City	454	1,706,302	26	2,673,478	209,885	375,544	43,818	832,332	81,367	1,542,946	1,130,532	—3,897	72,500	1,054,135	—119,345
Grand Rapids & Indiana	587	1,460,972	841,094	2,686,505	261,722	421,880	68,020	1,065,619	89,150	1,906,391	780,114	—102	137,626	642,386	178,027
Great Northern	7,344[20]	26,626,717	1,018,541	36,618,076	3,927,882	3,756,946	551,453	9,227,782	604,409	18,068,472	18,549,604	116,378	1,686,821	16,979,161	2,788,948
Gulf & Ship Island	307	692,935	223,219	995,897	136,403	181,043	14,297	281,561	48,815	662,119	333,778	.....	27,312	306,466	—38,308
Gulf, Colorado & Santa Fe	1,603[21]	4,669,830	1,645,649	6,705,791	1,174,763	939,306	158,551	2,403,002	188,733	4,864,355	1,841,436	.....	217,862	1,623,574	—186,581
Illinois Central	4,755[22]	19,226,754	7,148,079	30,254,142	4,487,631	6,892,854	710,990	11,427,559	781,432	24,300,466	5,953,676	—55,530	1,385,170	4,512,976	—3,416,584
Iowa Central	558	1,473,246	292,330	1,842,489	227,557	287,937	44,977	778,081	50,461	1,389,013	453,476	.....	57,904	395,572	6,104
Indiana Harbor Belt	104[23]	.....	.....	1,269,034	162,072	135,096	17,219	562,052	45,979	922,418	346,616	22,199	23,437	345,378	186,064
Kansas City Southern	827	3,432,549	854,847	4,821,271	483,424	691,820	159,199	1,627,042	180,420	3,141,905	1,679,366	.....	207,670	1,471,696	—377,784
Lake Shore & Michigan Southern	1,775[24]	16,265,893	6,298,918	25,615,954	2,681,270	3,095,819	525,465	7,932,735	442,495	14,677,784	10,938,170	725	863,940	10,074,955	3,626,872
Lehigh & Hudson River	96	759,598	27,215	798,810	101,490	109,337	7,413	263,207	30,842	512,289	286,521	.....	21,000	265,521	—3,761
Lehigh Valley	1,434[25]	16,466,234	2,695,709	19,829,997	2,250,994	3,339,587	493,622	6,517,620	409,655	13,011,478	6,818,519	—140,283	671,700	6,006,536	—42,414
Long Island	398[26]	1,698,956	3,893,549	5,834,357	734,253	653,625	91,043	2,471,778	126,263	4,076,962	1,757,395	431,316	321,322	1,867,389	237,456
Louisville & Nashville	4,704[27]	20,282,109	6,360,509	28,323,140	4,235,254	4,911,756	567,271	8,808,208	521,050	19,043,539	9,279,601	—6,789	893,700	8,379,112	588,122

Operated in the previous year—[1] 7,546; [2] 4,493; [3] 4,434; [4] 204; [5] 2,242; [6] 573; [7] 631; [8] 2,224; [9] 7,743; [10] 9,091; [11] 1,489; [12] 340; [13] 1,974; [14] 7,395; [15] 1,180; [16] 819; [17] 930; [18] 190; [19] 808; [20] 7,274; [21] 1,518; [22] 4,552; [23] 113; [24] 1,662; [25] 1,433; [26] 389; [27] 4,591. — Indicates Deficits, Losses and Decreases.

REVENUES AND EXPENSES OF RAILWAYS.

SIX MONTHS OF FISCAL YEAR, 1912—(CONTINUED).

Name of road.	Mileage operated at end of period.	Operating revenues			Operating expenses						Net operating revenue (or deficit).	Outside operations, net.	Taxes.	Operating income (or loss).	Increase (or decr.) comp. with last year.
		Freight.	Passenger.	Total, inc. misc.	Maintenance: Way and structures.	Maintenance: Of equipment.	Traffic.	Transportation.	General.	Total.					
Louisville, Henderson & St. Louis	199	$393,594	$218,750	$651,507	$146,505	$80,449	$25,623	$208,783	$18,398	$479,758	$171,749	$2,200	$18,000	$155,949	$6,239
Maine Central	1,179	3,339,433	1,926,898	5,599,604	1,078,819	662,613	57,778	1,947,562	161,954	3,908,726	1,690,878	31,580	256,683	1,465,775	214,228
Michigan Central	1,804[28]	10,166,946	4,362,870	16,105,076	1,895,870	1,709,886	403,433	5,914,229	267,178	10,190,596	5,914,480	25,814	704,322	5,235,972	1,840,949
Minneapolis & St. Louis	1,027	1,511,693	670,133	2,371,445	269,866	304,980	64,391	1,009,803	73,921	1,722,961	648,484	—221	118,477	529,786	—262,507
Missouri, Kansas & Texas	1,744[29]	5,871,098	2,346,604	8,727,369	1,274,965	1,241,365	211,184	2,717,128	245,445	5,690,087	3,037,282	—10,431	344,876	2,681,975	—101,796
Missouri, Kansas & Texas of Texas	1,345[30]	3,811,791	2,131,860	6,293,659	1,351,536	579,822	146,503	2,963,015	175,624	5,216,500	1,077,159	—3,137	178,626	895,396	—851,325
Missouri Pacific	3,915[31]	9,327,547	2,569,083	13,068,952	2,468,926	2,660,231	365,833	5,771,178	430,371	11,696,539	1,372,413	—21,604	495,600	855,209	—615,567
Mobile & Ohio	1,114	4,743,233	776,474	5,864,095	674,091	1,072,964	196,519	2,031,247	188,318	4,163,139	1,700,956	—6,190	149,105	1,545,661	16,885
Monongahela	64	579,354	14,383	602,429	90,950	43,516	1,885	126,829	11,519	274,699	327,730	.....	17,430	310,300	29,626
Nashville, Chattanooga & St. Louis	1,255	4,119,946	1,549,427	6,083,109	927,691	1,127,158	220,139	2,208,368	151,398	4,634,754	1,448,355	—6,491	142,896	1,298,968	—53,904
New Orleans & North Eastern	195	1,416,651	325,469	1,863,687	176,491	346,098	53,938	672,124	68,311	1,316,962	546,725	—4,521	53,571	488,633	—67,504
New York Central & Hudson River	3,591[32]	31,504,073	17,365,267	54,571,584	7,307,243	8,022,443	1,119,883	19,321,354	1,312,405	37,083,328	17,488,256	215,918	3,042,362	14,661,812	2,513,158
New York, Chicago & St. Louis	562[33]	4,731,147	905,130	5,866,203	688,999	586,975	278,589	2,273,904	100,550	3,929,017	1,937,186	—7,990	201,125	1,728,071	231,130
New York, New Haven & Hartford	2,091[34]	15,692,323	14,283,236	32,963,002	3,629,390	3,748,627	195,987	12,204,656	964,662	20,743,322	12,219,680	750,196	1,910,000	11,059,876	504,361
New York, Ontario & Western	565[35]	3,535,019	1,050,547	4,777,334	700,018	777,623	58,845	1,741,953	102,633	3,381,072	1,396,262	—3,071	107,500	1,285,691	—234,758
New York, Philadelphia & Norfolk	112	1,352,226	250,324	1,728,009	186,437	299,908	24,636	659,780	73,754	1,244,515	483,494	.....	45,000	438,494	—55,804
Norfolk & Western	2,004[36]	16,934,917	2,353,429	19,985,571	2,464,994	3,725,974	308,974	5,680,428	375,378	12,555,748	7,429,823	—14,696	690,000	6,725,127	519,519
Norfolk Southern	607[37]	997,978	465,252	1,594,283	179,770	193,460	35,484	513,115	79,571	1,000,500	593,783	—3,207	45,000	545,576	26,092
Northern Central	473[38]	4,916,713	1,241,113	6,538,064	604,290	1,321,823	91,580	3,200,816	142,573	5,361,082	1,176,982	4,166	242,020	939,128	146,820
Northern Pacific	6,018	23,631,307	8,648,156	34,479,770	4,314,128	3,556,355	594,497	10,421,367	485,536	19,371,883	15,107,887	291,567	1,723,979	13,675,475	—211,055
Oregon Short Line	1,761[39]	7,899,597	2,586,302	11,111,628	1,262,750	1,007,718	169,090	2,599,651	210,524	5,249,733	5,861,895	2,667	791,691	5,072,871	—131,638
Oregon-Washington R. R. & Nav. Co.	1,919	5,523,603	2,759,994	8,850,078	1,106,617	829,840	261,511	2,939,820	251,157	5,388,945	3,461,133	14,345	681,563	2,793,915	.....
Pennsylvania Co.	1,415	20,623,963	4,585,914	27,471,180	3,525,953	4,787,497	447,958	9,069,134	512,564	18,343,106	9,128,074	—7,865	1,124,035	7,996,174	—542,979
Pennsylvania R. R.	3,980[40]	58,640,266	18,109,825	82,161,731	9,158,131	15,822,896	1,126,493	29,417,919	2,037,459	57,562,978	24,598,753	—750,893	3,635,587	20,212,273	—576,667
Peoria & Eastern	351	1,141,286	390,193	1,654,005	218,552	227,678	33,332	650,253	35,183	1,164,998	489,007	.....	58,203	430,804	—59,125
Pere Marquette	2,331[41]	6,027,549	2,339,244	9,093,727	1,083,688	1,347,124	220,254	3,840,847	194,380	6,686,293	2,407,434	—12,444	341,011	2,053,979	238,185
Philadelphia & Reading	1,014[42]	18,063,678	3,683,610	22,757,415	2,126,098	4,136,725	246,674	7,106,107	394,960	14,010,564	8,746,851	175,874	542,285	8,380,440	236,886
Philadelphia, Baltimore & Washington	713[43]	4,757,423	4,066,459	9,794,906	1,327,182	1,637,267	156,552	3,899,457	221,350	7,243,808	2,551,098	.....	304,187	2,246,911	42,087
Pittsburgh & Lake Erie	215[44]	7,293,761	828,444	8,371,264	892,707	1,319,219	80,086	1,893,548	141,730	4,327,290	4,043,974	—1,524	177,389	3,865,061	—613,185
Pittsburgh, Cincinnati, Chic. & St. L.	1,467[45]	13,969,163	4,281,550	20,498,320	2,893,883	3,678,692	411,149	7,085,786	391,583	14,461,093	6,037,227	—5,235	770,397	5,261,595	222,002
Richmond, Fredericksburg & Potomac	83	594,549	428,337	1,169,402	123,413	153,384	17,206	429,831	34,894	758,728	410,674	.....	6,564	404,110	28,297
Rutland	468	955,182	680,136	1,842,885	216,359	253,300	45,629	691,626	41,211	1,248,125	594,760	.....	66,627	528,133	1,654
St. Joseph & Grand Island	319	535,667	235,931	843,166	153,509	114,042	30,641	360,999	33,323	692,514	150,652	76	42,483	108,245	15,439
St. Louis, Iron Mountain & Southern	3,314[46]	11,344,052	3,224,314	15,598,364	2,788,269	2,421,518	316,412	4,848,263	417,639	10,792,101	4,806,263	—37,496	492,440	4,276,327	529,676
St. Louis Merchants' Bridge Terminal	9	.....	1,812	847,687	148,397	61,810	2,611	453,613	30,906	697,337	150,350	.....	35,332	115,018	—147,152
St. Louis, San Francisco & Texas	243	460,068	179,642	683,120	110,608	94,031	18,239	293,886	27,380	544,144	138,976	.....	5,889	133,087	93,288
St. Louis Southwestern	796[47]	3,099,102	730,450	3,971,532	347,028	646,812	170,982	939,114	138,446	2,242,382	1,729,150	—6,141	123,225	1,599,784	4,872
Santa Fe, Prescott & Phoenix	364	554,296	221,219	825,292	124,184	77,244	18,438	240,831	33,160	493,857	331,435	.....	20,568	310,867	7,033
Southern	7,088[48]	20,711,538	9,087,031	32,347,237	3,748,739	5,113,112	813,013	10,778,506	926,587	21,379,957	10,967,280	38,677	1,218,652	9,787,305	285,664
Southern in Mississippi	280	364,999	214,309	624,649	136,936	52,228	14,221	226,564	22,210	452,159	172,490	.....	31,300	141,190	—3,241
Syracuse, Binghamton & New York	80	307,152	222,875	601,747	82,415	37,385	16,392	205,902	13,874	355,968	245,779	.....	37,320	208,459	—1,177
Tennessee Central	293	536,304	214,509	795,257	133,638	108,712	31,297	281,914	52,195	607,756	187,501	.....	25,243	162,258	—92,023
Terminal R. R. Ass'n of St. Louis	35[49]	.....	1,500	1,355,518	214,968	138,258	4,221	475,706	35,856	869,009	486,509	49,146	168,368	367,287	—109,379
Toledo & Ohio Central	440[50]	2,331,792	362,982	2,830,373	456,059	339,184	41,607	893,092	49,210	1,779,152	1,051,221	—5,812	122,538	922,871	—144,820
Toledo, Peoria & Western	247	371,398	245,930	656,079	107,799	142,526	13,996	242,753	20,355	527,429	128,650	.....	28,800	99,850	—30,614
Toledo, St. Louis & Western	450	1,678,901	255,784	2,061,080	255,594	378,982	49,416	735,181	52,744	1,471,917	589,163	.....	87,000	502,163	—92,317
Union Pacific	3,537[51]	18,191,636	5,672,268	26,086,325	2,390,408	2,924,563	655,245	6,961,464	622,332	13,554,012	12,532,313	—675	1,036,006	11,495,632	—2,317,851
Union R. R. of Pennsylvania	31	.....	.....	2,328,740	198,213	480,845	614	764,710	23,459	1,467,841	860,899	24,343	43,823	841,419	280,855
Union R. R. of Baltimore	9	626,556	126,034	762,325	64,975	.....	5,909	33,214	14,273	118,371	643,954	.....	35,537	608,417	—65,396
Vandalia	827	3,313,441	1,302,229	5,200,332	765,949	970,844	160,039	1,967,203	115,543	3,979,578	1,220,754	.....	169,323	1,051,431	—190,166
Vicksburg, Shreveport & Pacific	171	417,538	265,536	745,810	132,277	128,687	18,810	229,177	27,681	536,632	209,178	—1,448	42,472	165,258	—70,788
Virginian	474[52]	2,143,504	147,086	2,356,409	276,554	416,877	29,933	648,227	47,404	1,418,995	937,414	32,435	88,600	881,249	188,535
Washington Southern	35	196,961	214,583	545,753	65,948	58,655	7,276	209,512	16,244	357,635	188,118	.....	19,469	168,649	—18,640
West Jersey & Seashore	355[53]	998,229	2,430,445	3,660,282	504,591	609,562	85,928	1,443,952	62,762	2,706,795	953,487	—19,883	140,841	792,763	—133,464
Yazoo & Mississippi Valley	1,371	3,479,997	1,409,903	5,261,923	994,865	729,326	97,651	1,929,123	158,815	3,909,780	1,352,143	—2,007	227,982	122,154	—494,395

Operated in the previous year—[28] 1,803; [29] 1,736; [30] 1,348; [31] 3,919; [32] 3,587; [33] 561; [34] 2,041; [35] 545; [36] 1,952; [37] 602; [38] 470; [39] 1,617; [40] 3,982; [41] 2,337; [42] 1,022; [43] 717; [44] 191; [45] 1,468; [46] 3,316; [47] 768; [48] 7,038; [49] 34; [50] 444; [51] 3,472; [52] 473; [53] 353. —Indicates Deficits, Losses and Decreases.

The commission of Indiana has announced a tariff of charges for the transportation of merchandise by express companies, to go into effect March 15, which it is said will make an average reduction of 15 per cent. The commission holds that the express companies have extorted from the public "unusual and tremendous profits." Further, the commission recommends that the railways take over the express business and devote the "immense profits" of the business to improving their railways and perfecting safety devices. The maximum merchandise rates prescribed in the new tariff (100 lb. shipments) are, for 30 miles, 40 cents; 60 miles, 50 cents; 150 miles, 90 cents, etc.

New York: Rutland and Ontario & Western Sales Held Up.

The New York Public Service Commission, Second District (up-state), has notified the New York Central & Hudson River and the New York, New Haven & Hartford that the proof submitted by these companies on applications asking that the New York Central be allowed to buy the majority stock of the New York, Ontario & Western, and the New Haven to purchase the stock of the Rutland Railroad, is not satisfactory to the commission, and that on its own motion a further hearing has been called. To cover the questions the commission deems it essential that the individuals, both those who directed and those who took part in the negotiations, should be produced as witnesses and full disclosure be made of the reasons and purposes of the contracting parties. The commission says that three important matters are involved in each of these applications:

(1) Protection of rights of minority stockholders.
(2) Control of comparatively small railways by great systems.
(3) Possible elimination of competition by absorption of a competing line.

It is said that in both applications the proposed purchases are at prices above the market value of the stocks; both are of a bare majority of the stock and apparently for the purpose of control only; the business prospects of neither road whose stock is being purchased are such as to warrant the purchase as an investment; neither of the purchasing roads is in financial situation to warrant the purchase simply as an investment; and the condition of both roads whose stock is sought to be transferred is such financially that the majority of control can easily and without such violation of law as could be prevented by the courts, oppress the minority in carrying out the plans of the majority owner as to its entire system.

It is further pointed out by the commission that the control of comparatively small roads by great trunk line systems has been a fruitful source of complaint in the past and that following such complaints and the general dissatisfaction the public service commission law provides that no transactions such as are contemplated shall take place in this state unless authorized by the commission. In the opinion of the commission, the purpose of this provision is to prevent the use of smaller roads as mere pawns in great games carried on by the trunk line systems. Such ownership is not forbidden by law. It must, however, be with the authorization of the commission so far as it relates to transfers made after the enactment of the statute.

The commission says that in the case of the Ontario & Western the evidence is more full than in the case of the Rutland, and that the proposed transfer would not affect competition injuriously. Substantially, 70 per cent. of the business of the Ontario & Western is the hauling of anthracite coal. The through freight is now handled jointly with the N. Y. C., and the competition between the N. Y. C. and the Ontario & Western seems to be of small extent, not likely to be impaired by a change of control, and very largely under the control of the commission. As to the Rutland, the evidence with reference to the possible elimination of competition between it and the Boston & Maine, now controlled by the New Haven, is not satisfactory.

COURT NEWS.

The Atchison, Topeka & Santa Fe and the Southern Pacific have filed a petition with the Commerce Court for an injunction restraining the Interstate Commerce Commission from enforcing its recent order reducing the rate on lemons from California to eastern points from $1.15 to $1 per 100 lbs. A similar order of the commission was reversed by the Commerce Court last year, and the commission after a rehearing substantially reaffirmed its previous order, to take effect February 15.

Railway Officers.

ELECTIONS AND APPOINTMENTS.

Executive, Financial and Legal Officers.

J. M. Dewberry and E. H. Dulaney have been appointed assistants to the third vice-president of the Louisville & Nashville, and will perform such duties as may be assigned to them.

Frank H. Davis, treasurer of the Chicago & Alton, with office at New York, has been elected vice-president, succeeding Edwin Hawley, deceased.

R. B. Williams, auditor of freight accounts of the Oregon Short Line, with office at Salt Lake City, Utah, has been transferred to a position in the accounting department at Omaha, Neb., and his former office has been abolished.

A. W. Sullivan, who resigned on January 1 as general manager of the Missouri Pacific, as has already been announced in these columns, has been elected chairman of the Committee on Railway Mail Pay, with office at 75 Church street, New York.

A. C. Ridgway, whose appointment as acting vice-president in charge of the operating department of the Chicago, Rock Island & Pacific, with office at Chicago, was announced in these columns last week, has been elected second vice-president, succeeding F. O. Melcher, deceased.

J. S. Dennis, manager of the irrigation and land interests in Alberta and British Columbia of the Canadian Pacific, with office at Calgary, Alta., has been appointed assistant to the president in charge of the newly created natural resources department, with headquarters at Calgary.

A. E. H. Cheslay, assistant accountant of the Dominion Atlantic Railway, has been appointed general accountant, and is now chief of the accounting department, with office at Kentville, N. S., succeeding H. A. Prat, accountant, retired under the pension rules of the company. The office of accountant has been abolished.

W. S. Tinsman, whose appointment as assistant to the president of the Rock Island Lines, with office at Chicago, has been announced in these columns, was born September 8, 1867, at Berryville, N. Y. He was educated in the public schools, graduating in May, 1882, and in the same year began railway work as an office boy on the Rock Island, with which road he has been ever since. From 1885 Mr. Tinsman was consecutively telegraph operator, train despatcher and chief train despatcher, at Trenton, Mo.; and trainmaster and superintendent of terminals at Horton, Kan. He was made superintendent of the Oklahoma division in May, 1902; on February 20, 1904, was transferred to the Missouri division, and was general superintendent from June, 1905, to April, 1907. He was then promoted to assistant general manager, was manager from December, 1908, to December, 1909, and from December, 1909, to February 1, 1911, was general manager of the lines east of the Missouri river. From February 1, 1911, until his present appointment, he was general manager of the First district, with office at Chicago.

W. S. Tinsman.

William Frazer Owen, whose election as president and general manager of the New Orleans, Mobile & Chicago, with office at Mobile, Ala., has been announced in these columns, was born on March 31, 1856, at Mobile, Ala., and began railway work in

June, 1871, with the New Orleans, Mobile & Texas. From August, 1880, to June, 1905, he was in the service of Morgan's Louisiana & Texas Railroad & Steamship Company and the Louisiana Western, holding various positions until his promotion in June, 1885, from master of transportation to superintendent, which position he held for 20 years. In February, 1906, he became president of the New Orleans, Crowley & Western, a projected line, and in July, 1907, became assistant to the president of the Mobile, Jackson & Kansas City. In September of the same year he was appointed general manager of that road, and on December 1, 1909, at the time of the re-organization of that company he became vice-president and general manager of its successor, the New Orleans, Mobile & Chicago, which position he held at the time of his recent election as president and general manager of the same road.

N. M. Leach, traffic manager of the Texas & Pacific, who was recently appointed also assistant to the president of the International & Great Northern, as has been announced in these columns, was born near Maysville, Ky., September 14, 1869, and was educated in the public schools at Maysville and at Kentucky University. About 1887 he joined a corps of engineers running a preliminary survey on the Chesapeake & Ohio, and from 1888 until after 1897 he was with the Queen & Crescent, where he was consecutively clerk in the purchasing department; in charge of supply trains between Chattanooga, New Orleans and Shreveport; in the general freight office at Cincinnati; paymaster and supply agent of the New Orleans & Northeastern, the Alabama & Vicksburg and the Vicksburg, Shreveport & Pacific; and commercial agent of all the Q. & C. lines at New Orleans. He was appointed general agent of the Mobile & Ohio at New Orleans in 1902 and three years later was promoted to assistant general freight agent of the same road. In February, 1908, he went with the International & Great Northern as general freight agent at Palestine, Tex., and was promoted to traffic manager of that road and the Texas & Pacific in May, 1911. Following the reorganization of the International & Great Northern, he was appointed assistant to the president on January 1, 1912, and on the same date was made traffic manager also of the Opelousas, Gulf & Northeastern. Mr. Leach's office is at New Orleans.

N. M. Leach.

Operating Officers.

G. W. Murphy has been appointed trainmaster of the Delaware, Lackawanna & Western, with office at Binghamton, N. Y., succeeding R. M. Skeele, resigned.

E. W. Burgis, master mechanic of the New Orleans Southern & Grand Isle at Algiers, La., has been appointed superintendent, with office at Algiers, succeeding J. S. Landry, deceased.

Walter E. Knox has been appointed trainmaster of the Champaign district of the Illinois Central, with office at Champaign, Ill., succeeding William G. Tiley, assigned to other duties.

W. D. Beck, heretofore chief clerk to the president of the Chicago & Northwestern, has been appointed superintendent of dining and parlor cars, with office at Chicago, succeeding R. Matters, assigned to other duties.

G. D. Brooke has been appointed assistant superintendent of the Baltimore & Ohio, in charge of the East end of division, headquarters at Cumberland, Md., and J. W. Kelly, Jr., will have charge of the West end of division, with headquarters at Keyser, W. Va.

D. J. Murphy, Jr., assistant traffic superintendent and trainmaster of the Dominion Atlantic Railway at Kentville, N. S., has been appointed superintendent of transportation, with office at Kentville. William Fraser, traffic superintendent, has been retired under the pension rules of the company, and his former position has been abolished.

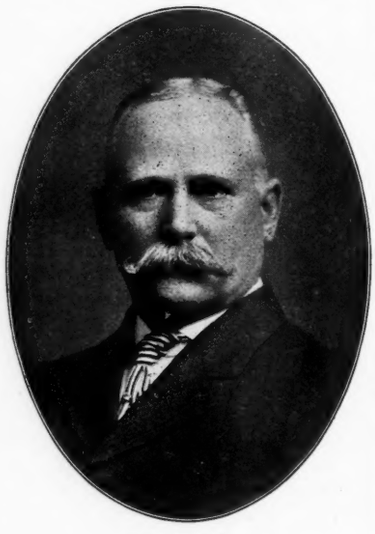
Andrew Ross, whose resignation as superintendent of the Old Colony division of the New York, New Haven & Hartford, was recently announced in these columns, has been appointed superintendent of the New Jersey & Lehigh division of the Lehigh Valley, with office at Easton, Pa., succeeding G. M. Harleman, who goes to the staff of the general manager.

F. P. Gutelius, general superintendent of the Eastern division of the Canadian Pacific at Montreal, Que., has resigned to accept a government position, as announced in General News. J. T. Arundel, general superintendent of the Manitoba division at Winnipeg, Man., has been transferred as general superintendent to Toronto, and D. C. Coleman, superintendent of car service at Winnipeg, succeeds Mr. Arundel.

H. B. Earling, general superintendent of the Chicago, Milwaukee & St. Paul at Chicago, has been appointed assistant general manager, with office at Chicago, a new position. W. S. Cooper, assistant general superintendent at Chicago, has been appointed general superintendent of the Southern district, with office at Chicago; J. H. Foster, assistant general superintendent at Minneapolis, Minn., has been appointed general superintendent of the Northern district, with headquarters at Minneapolis; and P. C. Eldredge, assistant general superintendent at Milwaukee, Wis., has been appointed general superintendent of the Middle district, with office at Milwaukee.

A change has been made in the division organization of the Union Pacific by which the line from Council Bluffs, Iowa, to Ogden, Utah—heretofore operated in three divisions as follows: Council Bluffs to North Platte, Neb.; North Platte to Rawlins, Wyo.; and Rawlins to Ogden—has been arranged in two divisions, the line from Council Bluffs to Cheyenne, Wyo., to be the Nebraska division; and that from Cheyenne to Ogden to be the Wyoming division. W. C. McKeown, superintendent of the former Wyoming division at Cheyenne, and H. J. Roth, assistant superintendent at the same place, have resigned; and W. B. Jeffers, superintendent of the former Utah division at Green River, Utah, has been appointed superintendent of the new Wyoming division, with office at Cheyenne.

Charles W. Jones, who has been appointed general manager of the Third district of the Rock Island Lines, with office at Fort Worth, Tex., as has been announced in these columns, was born November 6, 1860, at Milton, Ind. He was educated in the public schools at Des Moines and Mitchellville, Iowa, and at the Mitchell Seminary at the latter place, and on May 15, 1875, he began railway work with the Chicago, Rock Island & Pacific, with which road he has been ever since. From 1876 to 1892 he was consecutively station agent's helper, telegraph operator, station agent and operator, and train despatcher, and in the latter year was promoted to trainmaster. He was appointed assistant superintendent in February, 1895; in August of the same year was promoted to superintendent at Herington, Kan.; was transferred to the Eastern division at Horton, Kan., in October, 1897, to the Kansas division at Topeka, Kan., in May, 1902; and to the Iowa division at Des Moines in August, 1905. In February, 1909, he was appointed general superintendent, with office at Topeka, and a year later was transferred to Davenport, Iowa, as general superintendent of the Central district. When a change was made in the districts of the Rock Island Lines in February, 1911, Mr.



C. W. Jones.

Jones' title was made general superintendent of the First district, with office at Davenport, from which position he has just been promoted.

Traffic Officers.

E. A. Neil has been appointed coal freight agent of the Buffalo, Rochester & Pittsburgh, with office at Rochester, N. Y.

Charles H. Webb, commercial agent of the Texas & Pacific, with headquarters at Paris, Tex., has resigned to accept service with another company.

H. H. Smith, soliciting agent of the Louisville & Nashville at Chicago, has been appointed traveling freight agent of the Virginian Railway, with office at Cincinnati, Ohio.

C. E. Flandro has been appointed traveling freight agent of the Oregon Short Line, with office at Salt Lake City, Utah, succeeding E. J. Hanson, appointed contracting freight agent.

R. M. Langston has been appointed traveling freight agent of the Seaboard Air Line, with office at Atlanta, Ga., succeeding E. B. Rock, Jr., resigned to go to another company.

F. S. Sleight, soliciting freight agent of the International & Great Northern at Galveston, Tex., has been appointed traveling freight agent of the Missouri, Oklahoma & Gulf, with office at Dallas, Tex.

V. B. Sharritts, traveling freight agent of the Traders' Despatch at Indianapolis, Ind., has been appointed agent, with office at Indianapolis, and effective March 1. J. J. Klenke will succeed Mr. Sharritts.

W. A. Wayman, agent of the Erie Despatch at Kansas City, Mo., has been appointed assistant general manager, with office at Chicago, and E. R. Lauer, agent at St. Joseph, Mo., succeeds Mr. Wayman.

W. T. Labhart has been appointed soliciting freight agent of the St. Louis Southwestern, with headquarters at Fort Worth, Tex., succeeding E. L. Harrington, resigned to accept service with another company.

W. D. Jones, soliciting freight agent of the Tennessee Central, at Chicago, has been appointed traveling freight agent, with office at Chicago, succeeding W. G. Trapp, resigned to go to another company. George B. Hugel succeeds Mr. Jones.

John Paul, freight and passenger agent of the Niagara, St. Catharines & Toronto, at St. Catharines, Ont., has been appointed district freight agent of the Canadian Northern, with office at Winnipeg, Man., succeeding J. B. Sheppard, resigned.

E. E. Partridge, chief clerk to the general freight and passenger agent of the West Coast Route, which includes the Southern Pacific of Mexico and the Sonora Railway, has been appointed assistant general freight and passenger agent, with office at Guaymas, Sonora, Mex.

H. K. Lorraine, freight soliciting agent of the Southern Railway at Jacksonville, Fla., has been appointed commercial agent, with office at Jacksonville, and his former position has been abolished. E. L. Whitaker has been appointed freight soliciting agent, with office at Memphis, Tenn.

George B. Chapman, traveling freight and passenger agent of the Wabash at Des Moines, Iowa, has been appointed commercial agent, with office at Ottumwa, Iowa, succeeding S. Richardson, transferred. H. G. Brown, chief clerk to the district freight and passenger agent at Des Moines, succeeds Mr. Chapman.

J. T. Averitt, assistant general freight agent of the Chicago, Terre Haute & Southeastern at Chicago, has been appointed general freight and passenger agent, with office at Chicago, succeeding H. P. Radley, who had his office at Terre Haute, Ind., and who has been assigned to other duties. The office of assistant general freight agent has been abolished.

J. A. Brown, assistant general freight agent of the Trinity & Brazos Valley at Houston, Tex., has been appointed general freight agent of the New Orleans, Texas & Mexico and the Beaumont, Sour Lake & Western, and, also, assistant general freight agent of the St. Louis, Brownsville & Mexico and the Orange & Northwestern, with office at Houston.

Fred Geissler, traveling passenger agent of the Seaboard Air Line at Memphis, Tenn., has been appointed assistant general passenger agent, with office at Atlanta, Ga., succeeding C. D. Wayne, resigned to go into other business. W. A. Muse, traveling passenger agent at Atlanta, has been transferred to Memphis, and W. B. Gresham, city ticket agent at Birmingham, Ala., succeeds Mr. Muse.

W. P. Warner, district freight and passenger agent of the Chicago, Milwaukee & Puget Sound at Portland, Ore., has been appointed assistant general freight and passenger agent, with office at Spokane, Wash., a new position. R. L. Ford, commercial agent at the latter place, has resigned. E. K. Garrison, commercial agent at Los Angeles, Cal., succeeds Mr. Warner.

J. E. Crosland, chief clerk to the general freight agent of the Louisville & Nashville, at Louisville, Ky., has been appointed assistant general freight agent, with office at Louisville, succeeding E. H. Dulaney, appointed assistant to the third vice-president. L. A. Weaver has been appointed soliciting agent, with headquarters at Chicago, succeeding H. H. Smith, resigned to accept service with another company.

Frank Warfield, general freight agent of the Central Railroad of Pennsylvania, with office at Bellefonte, Pa., having died on January 18, the office of general freight agent has been abolished, and the general direction of the traffic department has been assumed by the president and the general manager. M. L. Altenderfer has been appointed general tariff agent, reporting to the president and general manager.

C. H. Green, contracting agent of the Canadian Northern at Hamilton, Ont., has been appointed contracting freight agent with office at Toronto. I. L. Healey, contracting freight agent at Hamilton, has been appointed traveling freight agent with office at Toronto, succeeding R. A. Lennox, transferred to Hamilton, and R. Logan, who has been in the general freight office at Toronto has been appointed contracting freight agent at Hamilton, succeeding Mr. Healey.

C. C. Taylor, commercial agent of the Mobile & Ohio, at Jackson, Tenn., has been transferred to Memphis, Tenn., and the office of commercial agent at Jackson has been abolished. W. S. Thompson has been appointed traveling freight agent, with headquarters at Jackson. J. A. Bolger has been appointed soliciting freight agent, with office at Chicago, succeeding W. M. Penick, promoted, and C. L. Voltz has been appointed soliciting freight agent, with headquarters at St. Louis, Mo., succeeding A. S. Birchett, promoted. C. R. Heyman succeeds Mr. Voltz.

R. F. Reynolds, assistant general freight agent of the Illinois Central and the Yazoo & Mississippi Valley at New Orleans, La., has been appointed foreign freight agent, with office at New Orleans, succeeding Henry Baldwin, appointed customs agent, in place of W. G. O'Connor, who has been assigned to other duties. R. D. Reeves, assistant general freight agent of the southern lines of the Illinois Central and of the Yazoo & Mississippi Valley at Memphis, succeeds Mr. Reynolds, and F. H. Law, commercial agent at Pittsburgh, Pa., succeeds Mr. Reeves. C. R. Phoenix, commercial agent at Minneapolis, Minn., succeeds Mr. Law, and C. S. Thompson, commercial agent at Milwaukee, Wis., succeeds Mr. Phoenix. C. C. Backus succeeds Mr. Thompson. A. E. Proctor has been appointed inspector of tariffs, with headquarters at New Orleans.

Engineering and Rolling Stock Officers.

Mortimer Silverman has been appointed electrical engineer of the Fort Dodge, Des Moines & Southern, with office at Boone, Iowa.

C. O. Busby has been appointed master of bridges and buildings of the Grand Trunk, with office at Durand, Mich., succeeding J. A. Sheedy, resigned.

F. M. Baumgardner has been appointed master mechanic of the Illinois Central, with headquarters at Clinton, Ill., succeeding L. E. Hassman, resigned.

T. A. Palmer, roadmaster of the Rock Island Lines at El Dorado, Ark., has had his jurisdiction extended to include Subdivision 55, from Packton, La., to Eunice, succeeding H. F. Clark, transferred.

J. T. Carroll, superintendent of motive power of the Baltimore & Ohio at Pittsburgh, Pa., has been appointed assistant general superintendent of motive power, with office at Baltimore, Md.,

and E. J. Searles, assistant to the general superintendent of motive power, has been promoted to superintendent of motive power at Pittsburgh, succeeding Mr. Carroll.

David Maulden Perine, whose appointment as superintendent of motive power of the New Jersey division of the Pennsylvania Railroad, with office at New York, has been announced in these columns, was born on February 13, 1869, at Baltimore, Md., and was educated in the schools of his native town, including a course in mechanical drawing and design at the Maryland Institute. He entered the service of the Pennsylvania Railroad on May 14, 1888, as an apprentice at the Mt. Vernon shops of the Northern Central, and three years later he was transferred to the Altoona shops. On April 1, 1894, he was appointed assistant road foreman of engines on the Pittsburgh division, and was promoted in August of the following year to assistant master mechanic of the Altoona machine shops. In March, 1899, he was made assistant engineer of motive power of the Northern Central and the Philadelphia & Erie, and in 1900 was transferred to Altoona as assistant engineer of motive power of the Pennsylvania Railroad division. From October, 1901, to August, 1903, he was master mechanic of the Pittsburgh division, and was then transferred as master mechanic to the West Philadelphia shops. Mr. Perine was promoted in April, 1906, to superintendent of motive power of the Northern Central and the Philadelphia & Erie; one year later he was transferred to Pittsburgh as superintendent of motive power of the Western Pennsylvania division, which position he held at the time of his recent appointment as above noted.

D. M. Perine.

OBITUARY.

Lewis Kingman, office engineer of the National Railways of Mexico, at Mexico City, died at that place on January 27. Mr. Kingman was born February 26, 1845, at Bridgewater, Mass., and began engineering work in Boston in 1862. Mr. Kingman held various railway positions, having been chief engineer of the Chihuahua division of the Mexican Central from 1883 to 1884, and again from 1895 until that road was taken over by the National Railways of Mexico, since which time he has been assistant chief engineer and then office engineer of the latter road. Mr. Kingman became a member of the American Society of Civil Engineers in 1885, and was a charter member of the American Railway Engineering and Maintenance of Way Association.

Beverly Welford Wrenn, formerly passenger traffic manager of the Plant System, died on February 6 in New York, at the age of 67. Mr. Wrenn was born at Culpeper, Va., and began railway work on November 1, 1868. He was general passenger and ticket agent of the Western & Atlantic until September, 1884, and from that time until August, 1894, was general passenger and ticket agent of the East Tennessee, Virginia & Georgia, in which position he had charge of the through passenger traffic of the Virginia, Tennessee & Georgia Air Line, which was composed of the East Tennessee, Virginia & Georgia, the Norfolk & Western, and the Shenandoah Valley railways. He remained with that company until it was absorbed by the Southern in August, 1894, and was general passenger agent of the Memphis & Charleston until January, 1895, when he was appointed passenger traffic manager of the Plant System of Railways and Steamships, which position he held until July 1, 1902, when it was absorbed by the Atlantic Coast Line. Mr. Wrenn had been in business for the past ten years in New York.

Equipment and Supplies.

LOCOMOTIVE BUILDING.

The Nebraska Northwestern, Davenport, Iowa, is in the market for two locomotives.

The Wabash is in the market for 10 freight locomotives, 10 passenger locomotives and 10 switching locomotives. (See item under General News.)

The Lorain & West Virginia has ordered one consolidation locomotive from the American Locomotive Company. The dimensions of the cylinders will be 21 in. x 28 in.; the diameter of the driving wheels will be 51 in., and the total weight in working order will be 192,000 lbs.

CAR BUILDING.

The Southern is said to be in the market for 18 passenger cars. This item has not been confirmed.

The Canadian Pacific is taking prices on 600 side-dump ballast cars.

The Chicago, Rock Island & Pacific is in the market for 700 all-steel general service cars.

The Chilean State Railways have ordered 100 freight cars from the Middletown Car Works.

The Chicago, Milwaukee & St. Paul will build 1,000 box cars and 500 refrigerator cars at the company shops.

The Nebraska Northwestern, Davenport, Iowa, is in the market for 2 passenger coaches and 12 freight cars.

The Cudahy Packing Company, Chicago, has ordered 350 steel underframe, refrigerator cars from the Haskell & Barker Car Company.

The Erie, it is said, will have heavy repairs made to 1,000 box cars by the Central Locomotive & Car Works, and will have 300 refrigerator cars rebuilt by the Whipple Car Company. This item has not been confirmed.

The Pennsylvania System has ordered 75 passenger cars from the Pressed Steel Car Company, 75 passenger cars from the American Car & Foundry Company, and 50 passenger cars from the Standard Steel Car Company.

The Wabash is in the market for 1,000 40-ton steel underframe, 36-ft. and 40-ft. stock cars; 1,000 steel underframe, 36-ft., 40-ton box cars; 750 40-ft., 40-ton automobile cars; 200 50-ton, all-steel hopper cars and 20 passenger cars. (See item under General News).

The Western Maryland is now in the market for 1,000 forty-ton steel underframe box cars, 750 fifty-five-ton all-steel hopper cars, 500 fifty-ton gondola cars, 500 forty-ton gondola cars, 15 passenger coaches, 6 combination mail and express cars, and 5 baggage cars.

IRON AND STEEL.

The Wabash is figuring on from 15,000 to 20,000 tons of rails.

The Great Northern has increased its recent rail ore from 36,000 to 60,000 tons, of which 10,000 tons have been ordered from the Illinois Steel Company and 14,000 tons divided between the Lackawanna Steel Company and the Colorado Fuel & Iron Company.

The Pennsylvania Railroad has ordered 150,000 tons of rails. The order was divided as follows: Pennsylvania Steel Company, 33,000 tons; Cambria Steel Company, 32,000 tons; United States Steel Corporation, 66,000 tons; Lackawanna Steel Company, 12,000 tons; Bethlehem Steel Company, 7,000 tons.

SIGNALING.

(New Installations of Block Signals, Interlocking, Telephones for Train Despatching, Etc.)

In compliance with an order of the state railway commission the Southern Railway is preparing to install the manual block system on its St. Louis division through Indiana, the work to be completed by May 1. Stations will be about eight miles apart. From thirty-five to fifty signal men will be needed. It is understood that telephones will be used.

Supply Trade News.

The Standard Scale & Supply Company, Chicago, has changed the name of its Eclipse low charging concrete mixers to Standard low charging concrete mixers.

The office of E. A. Craig, southeastern manager of the Westinghouse Air Brake Company and the Westinghouse Traction Brake Company, has been moved from Wilmerding, Pa., to Pittsburgh.

W. V. Kelley, president of the American Steel Foundries, New York, has been made chairman of the board of directors, and R. P. Lamont, vice-president, has been made president, succeeding Mr. Kelley.

Howard W. Evans, formerly general sales manager of the Crane Company, Chicago, has been made general sales manager of the Best Manufacturing Company, Pittsburgh, Pa., makers of pipes and pipe fittings.

The H. W. Johns-Manville Company, New York, has acquired the sole selling agency for the entire products of I. P. Frink, New York, manufacturer of Frink reflectors and fixtures, and is now in a position to design and sell lighting systems for all forms of artificial illumination.

The Sargent Company, Chicago, has received orders for iron-clad water glass protectors and E. S. E. valves for 75 locomotives to be built for the Chicago & North Western, and for 16 locomotives to be built for the Chicago, St. Paul, Minneapolis & Omaha, by the American Locomotive Company, New York.

A. L. Whipple, for some years in the railway supply business, and for the last two years president and general manager of the Whipple Supply Company, New York, has resigned, and the company will be dissolved. Mr. Whipple's plans for the future are as yet uncertain; but for the present he will be located at the office heretofore occupied by the Whipple company.

Charles Booth, who has been connected with the Chicago Pneumatic Tool Company, Chicago, since its organization, has been made district manager of the company's New England territory, with office in Boston, Mass., succeeding J. M. Towle, resigned. Mr. Booth was a vice-president of the company until September 1, 1911, when he resigned that position on account of ill health.

L. A. Darling, formerly chief engineer of the R. G. Peters Manufacturing Company, Grand Rapids, Mich., has gone to the Remy Electric Company, Anderson, Ind., as engineer of the locomotive headlight department. Mr. Darling has been in the mechanical engineering and the designing departments of the Southern Pacific, and turbine designer for the General Electric Company, Schenectady, N. Y.

R. A. Ogle and C. F. Bledsoe, formerly connected with the Otto Gas Engine Company, Chicago, have organized the Ogle Construction Company, with office at 332 South Michigan avenue, Chicago, and will build water stations, water cranes, pipe lines, pumping stations, coaling stations, coal hoists, coal spouts and coal buckets and loaders. Mr. Ogle is president and treasurer of the company, and Mr. Bledsoe is vice-president and secretary.

J. Howard Mitchell, one of the founders of the William Butcher Steel Works, which was afterward the Midvale Steel Works, Nicetown, Pa., and senior member of the firm of Philip S. Justice & Company, Philadelphia, Pa., dealers in railway supplies, died on February 6 at his home at Hatboro, from a general breakdown, due to old age. For four weeks Mr. Mitchell, who was 79 years old, was confined to his house. Previous to that time, however, he took an active part in the business of the firm of which he was a member.

Thomas M. Gallagher, formerly a vice-president of the Scullin-Gallagher Iron & Steel Company, St. Louis, Mo., died at his home in St. Louis on February 1. Mr. Gallagher for a number of years was connected with the Mobile & Ohio, resigning in 1865, as foreman of the shops at Columbus, Ky. From 1867 to 1869 he was superintendent of the Southwestern Express Company, Cincinnati, Ohio. For several years he was connected with the Shickle, Harrison & Howard Iron Company as superintendent, general manager and vice-president, and from 1899 to 1910 he was a vice-president of the Scullin-Gallagher Iron & Steel Company.

The Eagan-Rogers Steel & Iron Company has just been incorporated in Pennsylvania, with $100,000 capital. It has acquired a five acre tract on the Pennsylvania Railroad between Crum Lynne, Pa., and Eddystone, and is now erecting steel buildings, the contract for which has been let to the McClintic-Marshall Construction Company, Pittsburgh, Pa. The company will make light steel castings weighing up to 200 lbs, in addition to grey iron castings and other specialties. Steel made by the electric process will be furnished, as the company has obtained American rights for a successful process now in use in England. The principals are Daniel C. Eagan and John I. Rogers. Mr. Eagan is a son of the late Daniel Eagan. Mr. Rogers is an engineer and was formerly with the Midvale Steel Company, Philadelphia, Pa., in charge of various departments; he has been in consulting practice for the last few years in New York and Philadelphia. The plant will be in active operation by March 1.

Charles B. Jenks, western sales manager of the Standard Coupler Company, New York, for several years with office in Chicago, has been made sales manager for Edwin S. Woods & Company, Chicago. Mr. Jenks has a wide acquaintance with both railway officers and supply men in all parts of the country. For eight years he was employed in the traffic department of the Pennsylvania Railroad, and for six years he was in the engineering and construction department of the Atlantic Refining Company, Philadelphia, Pa. In 1892 he went to the Pressed Steel Car Company, Pittsburgh, Pa., and for two years was in the operating department as assistant to the vice-president at Pittsburgh. For the next five years he was in the sales department at Chicago. In 1909 he resigned to go to the Standard Coupler Company as western sales manager.

Charles B. Jenks.

TRADE PUBLICATIONS.

CULVERTS.—The Canton Culvert Company, Canton, Ohio, has published a small illustrated folder describing and illustrating its Acme Nestable corrugated culverts. This folder is entirely in Spanish.

AUTOMATIC TIME SWITCHES.—The General Electric Company, Schenectady, N. Y., has devoted bulletin No. 4893 to a general description of two automatic time switches, types T 5 and T 6, for alternating and direct current circuits.

BOILER TOOLS.—The J. Faessler Manufacturing Company, Moberly, Mo., has published an illustrated folder describing Faessler octagonal sectional expanders, roller expanders and flue cutting machines, and pointing out their advantages.

EXHAUST FANS.—The American Blower Company, Detroit, Mich., has published bulletin 323 on A B C steel plate exhaust fans, type E. This bulletin is fully illustrated and includes detailed descriptions, diagrams and dimension tables.

DRILLS.—The Ingersoll-Rand Company, New York, has published bulletin No. 4204 on Arc Valve tappet rock drills, telling of the efficiency of these drills equipped with Sergeant drill chucks. Illustrations of these drills in operation are given and a list of duplicate parts is included.

Southern Railway.—The land and industrial department of this company has published a useful little booklet entitled A Western North Carolina Opportunity, which gives many points on the growing of cabbages and potatoes in this region. Some figures are included on the yield, the cost of production and land values.

Automatic Starting Control.—The Reliance Electric & Engineering Company, Cleveland, Ohio, has published bulletin No. 7010 on automatic starting control, in which the advantages of this device as a power saver are pointed out. Illustrations are included of various machine tools on which this device has been applied.

Piping Materials.—The Best Manufacturing Company, Pittsburgh, Pa., has published a 400-page cloth-bound catalog of piping materials for steam, air and hydraulic high pressure piping systems, including valves, fittings, flanges, pipe and pipe bends, separators, etc. The list price and a brief description are given of each article.

Drills.—The Cleveland Twist Drill Company, New York, has published an effective folder on Paragon Flatwist drills. The special feature of this folder is the reprint of an article on tests made with this drill. This article appeared in 21 different trade journals and a fac-simile of each of the pages on which it appeared is given.

Pipe Protection.—The National Tube Company, Pittsburgh, Pa., has published bulletin No. 8 on National coating for protection against corrosion and electrolysis. This coating can be applied to pipe ranging from 3 in. to 18½ in. outside diameter. The bulletin describes the process of applying this coating, and gives suggestions regarding the laying of pipe covered with National coating.

Electric Hoists.—The Sprague Electric Works (New York) of the General Electric Company has devoted a small illustrated booklet to the advantages and illustrations of the various types of Sprague electric hoists for handling loads which, on account of their location, are inaccessible to the ordinary traveling crane, or which are too small to be economically handled by such a large and expensive machine.

Norfolk Southern.—The passenger department of this company has published a very attractive 70-page booklet entitled Corn, Cotton and Cash, telling of the advantages to be found in the Carolina coast country along this company's lines. The various localities are described and the products, industries and facilities are set down in an enticing manner. The booklet is well illustrated and includes a large map.

Locomotive Stokers.—Clement F. Street, Schenectady, N. Y., has issued publication No. 6 on the Street locomotive stoker, in which each function of this stoker is clearly and concisely described. Illustrations are given of each separate part, and also of the stoker applied to locomotives. Illustrations and the principal dimensions of five of the largest locomotives on which these stokers have been successfully used are given. The booklet also includes large diagrams.

Toncan Metal.—The Stark Rolling Mill Company, Canton, Ohio, has published a 36-page booklet on Toncan metal, pointing out its chief characteristics and advantages. The first part of the booklet deals with corrosion, telling what causes it and how it may be obviated. In the second part of the booklet some interesting results of tests are shown by photographs. The remainder is devoted to illustrations, descriptions and prices of the various products made of this metal.

Axle Car Lighting.—The United States Light & Heating Company, New York, has published three bulletins on the Bliss system of axle electric car lighting. Bulletin No. 207 is illustrated and gives detailed descriptions of this system. Bulletin No. 105 describes National storage batteries for electric lighting of railway cars which are used in connection with the Bliss system of axle car lighting. Bulletin No. 208 A is devoted to a list of spare parts for axle car lighting equipments.

Work on the railway extension from Lockhart, New South Wales, to Clear Hills, is progressing rapidly. The line is practically complete as far as Urana, and it is expected that this section will open for traffic shortly.

Railway Construction.

New Incorporations, Surveys, Etc.

Bamberg, Ehrhardt & Waterboro.—An officer writes that grading has been finished on 11 miles of the line now under construction from Bamberg, S. C., south to Ehrhardt, 14 miles. The Ajax Construction Company, Bamberg, and W. C. Wolfe, Orangeburg, are the contractors. J. A. Wyman, president, Bamberg; T. Black, vice-president, and W. D. Rhodes, secretary and treasurer.

Barre Granite.—See Central Vermont.

Beaver, Meade & Englewood.—An officer writes that the projected route is from Beaver, Okla., north to Meade, Kan., about 40 miles, of which seven miles is to be finished within four months. The work on the heaviest mile involves the handling of about 20,000 cu. yds. The company expects to develop a traffic in wheat, broom corn and live stock, and contracts will be let to local contractors to carry out the work. T. C. Tracy, president, Beaver, Okla. (February 2, p. 221.)

Bruce Mines & Algoma.—This company, which operates a 17-mile line from Bruce Mines, Ont., to Rock Lake, has asked permission to build branch lines not to exceed 12 miles long. J. Knight, superintendent, Bruce Mines.

Canadian Eastern Construction Company.—Incorporated in Maine with $1,000,000 capital, to build railways. A. R. Gould, president of the St. John Valley Railway, which was recently granted a subsidy by the New Brunswick government to build from St. John, N. B., to Aroostook Falls and Grand Falls, N. B., 208 miles, is president of the new company.

Cary North & South.—An officer writes that a contract has been given to T. W. Ellis, Jr., Macon, Ga., for work on a 10-mile section from Cochran, Ga. The plans call for building from Cochran north via Cary to Danville, and the line will probably be extended to Toomsboro, about 21 miles, also to Milledgville or to Sandersville. The maximum grades will be 1 per cent., and maximum curvature 4 deg. The company expects to develop a traffic in lumber, cotton and products, also merchandise. D. B. Dunn, chief engineer, Macon, Ga.

Central Vermont.—Under the name of the Barre Granite Railway, a company has been incorporated in Vermont with $100,000 capital, to build a 10-mile line from Barre, Vt., to Williamstown, which is the present terminus of a branch of the Central Vermont. The incorporators of the new company include E. H. Fitzhugh, president, and other officials of the Central Vermont. The plans call for putting up several steel bridges on the branch of the Central Vermont and on the new line.

Chicago, Joliet & Kansas City.—This company has been given a charter in Illinois to build from Chicago, Ill., to Kirthsbury; also from Rockford to Peoria. The incorporators are all residents of Chicago.

Chicago, Paducah & Thebes.—Incorporated in Illinois, to build from Streator, in Lasalle county, south to Brookport, Massac county, connecting with a branch from a point in Clay county to Thebes. The incorporators include C. B. Long, W. E. Beckwith, F. W. Boekenkroeger, A. M. Beckwith and W. R. Brow, all of East St. Louis.

Chesapeake & Ohio.—On the Hinton division, the Winding Gulf extension of the Piney Creek branch has been extended from Sullivan, W. Va., to Tams, 11½ miles, and on the Huntington division of the Coal River district, the line from Sproule, W. Va., to Peytona has been extended from Peytona to Seth, seven miles. F. I. Cabell, chief engineer maintenance of way, Richmond, Va.

Delaware, Lackawanna & Western.—The plans for the proposed improvements to be carried out in Pennsylvania, for which bids are to be let about March 1, provide for the construction of a new roadbed for a double track from Clarks Summit, Pa., seven miles north of Scranton, north to New Milford, about 31 miles. This will reduce the distance three miles over the existing line. The new work is to be carried out to eliminate curves, heavy grades and crossings at grade. The maximum curvature on the new line will be 3 per cent. The grade for 18 miles will

be .2 per cent., and for seven miles .7 per cent. The plans call for piercing a tunnel 3,600 ft. long, near Nicholson, and at a point two miles north of the tunnel, constructing a viaduct 2,100 ft. long. Another viaduct 1,300 ft. long will also be put up at Martin's Creek, near Kingsley. The work will be let in ten sections. (January 12, p. 76.)

FORT SMITH & WESTERN.—An officer writes regarding the reports that this company expects to begin work on a branch to Oklahoma City, Okla., in the near future, that there is a probability that the line will be built. No action has yet been taken to carry out the work. W. M. Bushnell, general manager, Fort Smith, Ark.

GEORGIA, ALABAMA & WESTERN.—Incorporated in Georgia with $200,000 capital, it is said, to build from Milltown, Ga., west to Blakely, about 125 miles. The incorporators include E. H. Beck, W. W. Webb and L. M. Stanfield, Hahira; R. Barfield and G. W. Dean, Waycross, and J. F. Harris.

GLENGARY & STORMONT.—This company has asked for incorporation in Canada, to build from a point on the Canadian Pacific at the eastern boundary of the province of Ontario, in the township of Lancaster, county of Glengary, south, thence westerly through the township of Charlottenby to Cornwall. C. L. Hervey, Ottawa, Ont., is interested.

GREAT NORTHERN.—An officer writes that the work on the new terminals of the Midland Railway of Manitoba, in Winnipeg, Man., is nearing completion. A. H. Hogeland, chief engineer, St. Paul, Minn.

GULF LINES CONNECTING.—Incorporated in Illinois, to build from a point near Danville, Vermilion county, south through the counties of Edgar, Clark, Crawford, Lawrence, Wabash, Edwards, White, Gallatin, Hardin, Pope, and Massac, to a connection with the new bridge at Paducah, with a branch east to a point on the Wabash river opposite Mt. Vernon, Ind., and another branch west to Thebes and Cairo. The incorporators include P. A. Schlafly, W. S. Louden, E. P. Keshner, N. P. Murray, Jr., and H. J. Hornburg, all of East St. Louis.

HOUSTON & TEXAS CENTRAL.—An officer writes that contracts are to be let early in February for work on a 10-mile section of the branch being built from Stone City, Tex., southwest via Caldwell to Giddings, 40 miles. A contract for work on 13 miles was let last fall to Owen, Levy & Owen, Giddings. The work involves the handling of an average of about 30,000 cu. yds. a mile. There will be five steel bridges, which have already been bought, varying in length from 60 to 500 ft. each, and a trestle over the Brazos river. E. B. Cushing, chief engineer, Houston. (December 1, p. 1148.)

KANSAS CITY TERMINAL RAILWAY.—See Kansas City, Mo., under Railway Structures.

KISSIMMEE, NARCOOSSEE & EAST COAST.—Oragnized in Florida with $100,000 capital, it is said, to build a 10-mile line from Narcoossee, Fla. C. W. Ward, J. M. Lee, W. A. McCool and H. C. Stanford are said to be interested.

LEXINGTON & EASTERN.—See Louisville & Nashville.

LINDSAY & MINDEN.—Application has been made for a charter in Canada to build from Lindsay, Ont., north via Minden to Mountain Lake. A. H. Delemere, Minden, is interested.

LOUISIANA ROADS (Electric).—Surveys are now being made, it is said, for a line to connect Covington, La., Madisonville, Slidell and New Orleans. Franchises have been granted to W. J. Tracy, Cleveland, Ohio, and it is understood that W. P. Slifer, Pittsburgh, Pa., is the engineer.

LOUISVILLE & NASHVILLE.—On the Lexington & Eastern the North Fork extension has been extended to Haddix, Ky., six miles from Jackson. W. H. Courtenay, chief engineer, Louisville, Ky.

The Wasioto & Black Mountain is to be extended about 15 miles, it is said, to new coal fields in Kentucky. W. H. Courtenay, chief engineer, Louisville, Ky.

MEXICAN SOUTHERN.—A new branch has been opened for business from Oaxaca, Mex., southwest to Tlacolula, 20 miles. S. W. Massey, superintendent, Oaxaca, Oax., Mex.

MIDLAND OF MANITOBA.—See Great Northern.

MINNEAPOLIS, ST. PAUL & SAULT STE. MARIE.—An officer is quoted as saying that this company intends to build, during 1912, a connecting line from Drake, N. D., northeast to Fordville, about 175 miles. T. Greene, chief engineer, Minneapolis, Minn.

NATCHEZ EASTERN.—This company was organized in August, 1911, and it is said that financial arrangements are being made by J. M. Sechrest & Company, Inc., Buffalo, N. Y., to build from Natchez, Miss., northeast to Meridian, about 200 miles.

NORFOLK & WESTERN.—An officer writes that the company proposes to build this year 3.3 miles of third track between Norfolk, Va., and Lambert Point; 16.4 miles of second track between Gilmerton and Suffolk; 11 miles of second track between Nottoway and Burkeville, and 13.2 miles of second track between Evergreen and Phoebe. Nearly all of this work will be carried out by the company's forces.

NORTHERN PACIFIC.—The Ocosta branch of the Tacoma division has been extended from Ocosta, Wash., to Bay City, three miles. W. L. Darling, chief engineer, St. Paul, Minn.

PACIFIC, TRANS-CANADA & HUDSON BAY.—This company has been incorporated in Canada to build from Edmonton, Alta., to Athabaska, thence to Port McMurray, and eventually west to Prince Rupert, B. C. Permission has also been granted to build easterly to Hudson Bay at either Fort Churchill, or Ft. Nelson. The names of the promoters are not given.

PORT BOLIVER IRON ORE.—This company, which recently finished a line from Longview, Tex., to Ore City, 30 miles, is planning to build an extension, it is said, north to a point in Oklahoma, about 150 miles. A survey for the first section is now being made via Daingerfield to Clarksville, 70 miles, and construction work between Ore City and Clarksville will be started soon. L. L. Featherstone, secretary, Longview. (December 8, p. 1189.)

ST. JOHN VALLEY.—See Canadian Eastern Construction Company.

SALEM, FALLS CITY & WESTERN.—This company, which operates a line from West Salem, Ore., to Black Rock, 27 miles, has under consideration the question of building an extension from Salem, northeast via Silverton, Molalla and Mulino, to Oregon City, about 50 miles, with a branch from this extension southeast to Stayton, about 20 miles. S. B. Taylor, chief engineer, Dallas, Ore.

SOUTHERN PACIFIC.—A new branch, called the Tulasco branch, has been opened for business on the Carlin sub-division of the Salt Lake division from Tulasco, Nev., to Metropolis, eight miles. W. Hood, chief engineer, San Francisco, Cal.

SOUTHERN RAILWAY.—An officer writes that a contract has been given to M. M. Elkan, Macon, Ga., to build the belt line at High Point, N. C., connecting the main line with the Asheboro branch. The line will be about two miles long, and is to be built in a generally easterly direction to the Asheboro branch. Grading will be started early in February. The approximate excavation will average 36,000 cu. yds. a mile. W. H. Wells, chief engineer of construction, Washington, D. C. (December 22, p. 1301.)

SUDBURY-COPPER CLIFF SUBURBAN.—This company, with headquarters at Sudbury, Ont., has asked for a charter in Canada, to build from Sudbury westerly to Copper Cliff, also from Sudbury easterly to Coneston. Clary & Buchanan, Sudbury, are interested.

TAMPA & GULF COAST.—This company, which operates a 22-mile line from Tarpon Springs, Fla., east to Lutz Junction, is said to have under consideration the question of building an extension south to Tampa, about 12 miles. C. H. Brown, president, Tampa.

UTAH COAL RAILWAY.—Incorporated in Utah with $125,000 capital to build a nine-mile line from Provo, Utah, southeasterly to the mouth of Huntington canyon, also to build a branch from Nephi, about five miles. The directors include W. M. Bradley, president, W. Ashton, vice-president, S. J. Harkness, secretary and treasurer, R. B. Harkness and W. Pischel.

VALLEY & SILETZ.—Incorporated in Oregon, with $300,000 capital, to build from Falls City, Ore., to Simpson. The incorporators include F. S. Velcher, H. A. Packard and T. V. Littlefield.

Virginia & Kentucky.—An officer writes that the plans call for building 44 miles of line, which have been under consideration for some time, in Virginia, to the Virginia-Kentucky state line. The company will not carry out any of the work during 1912. F. M. McClure, secretary and superintendent, Wise.

Wabash.—(See item under General News.)

Wasioto & Black Mountain.—See Louisville & Nashville.

Wichita Falls Route.—An officer writes that contracts have been let for the extension north of Hammond, Okla., via Moorwood, Trail, Camargo, Shanon, Woodward, Supply, May and Gate to Forgan in Beaver county, which is eight miles north of Beaver. Track has been laid from Hammond to a point south of the Canadian river crossing near Camargo, also from Shanon to May, a total of about 60 miles. There will be very little rock work, the grading work involves handling an average of about 20,000 cu. yds. a mile. M. M. Cooke, chief engineer, Wichita Falls. (January 26, p. 177.)

RAILWAY STRUCTURES.

Binghamton, N. Y.—The New York Public Service Commission, Second district, has ordered the elimination of the grade crossing on the Delaware, Lackawanna & Western, and the Delaware & Hudson at Robinson street in Binghamton. The grade of the street is to be carried under the grade of both railways by means of a subway.

Cincinnati, O.—The Norfolk & Western will enlare its yards at Clare.

Corning, N. Y.—The New York Public Service Commission, Second district, has ordered the eliminating of the First street and the Columbia street grade crossings of the Erie Railroad in Corning. The Columbia street crossing is to be entirely abandoned and the traffic carried under the railway by means of a subway at First street. The cost of the work will be $60,000.

Kansas City, Mo.—An officer of the Kansas City Terminal writes that a large number of contracts are still to be let for viaducts, subways and retaining walls, in addition to the contracts already let for the construction of the Burlington connection, estimated cost $400,000, the O. K. Creek sewer, estimated cost $900,000, the station building proper, estimated cost $5,750,000, and various subways, viaducts and returning walls amounting to over $1,000,000. The estimated cost of the entire improvements in connection with the Kansas City passenger terminal is $37,000,000. Contracts were let some time ago to the W. P. Carmichael Company, Kansas City, for building a retaining wall east of Brooklyn avenue, and to O'Hagen & Lake, Aurora, Ill., for the subway at Independent road. The Freeborn Engineering Company, Kansas City, has the contract for a concrete abutment over the viaduct at 18th street near Agnes avenue, and Bernard Corrigan, Kansas City, has the contract for building the Burlington connection, together with bridge abutment and retaining walls. A $500,000 contract has recently been let to John J. O'Heron & Company, Chicago, for concrete work in connection with the new union station. (November 10, p. 975D.)

Marquette, Mich.—The Duluth, South Shore & Atlantic will build a new brick freight station 126 ft. x 40 ft.

North Bay, Ont.—The Canadian Pacific has asked for waterfront lots on Lake Nipissing, fronting the company's property at North Bay for a distance of 3,000 ft. along the shore and extending 900 ft. into the lake. This is to be filled in and used as a site for new repair shops and extensions to the works and yards. The plans for a large repair shop, to cost $250,000, have been submitted to the town council.

Temple, Tex.—The blacksmith shop and roundhouse of the Atchison, Topeka & Santa Fe was destroyed by fire on January 30.

Trent., Wash.—The Northern Pacific has given a contract for building a steel bridge over the Spokane river, near Trent, to McCreary and Willard, Spokane, Wash.

Winnipeg, Man.—See Great Northern under Railway Construction.

Railway Financial News.

California Northeastern.—A press despatch from Yreka, Cal., says that the property of this company has been acquired by the Oregon Eastern Railway, a subsidiary of the Southern Pacific, for $5,200,000. The Northeastern runs from Weed, Cal., to Klamath Falls, Ore. The Northeastern was a company organized by the Southern Pacific.

Chicago & North Western.—This company has sold to Kuhn, Loeb & Company, New York, $15,000,000 Sparta & Northwestern first mortgage 4 per cent. bonds of 1912-1947 guaranteed principal and interest by the Chicago & North Western.

Chicago, St. Paul, Minneapolis & Omaha.—Having previously received permission from the railway commission of the state of Wisconsin, directors have authorized issuance of $5,000,000 debenture 5 per cent. bonds, $1,300,000 to pay for additions, betterments, and equipment already purchased, and the remaining $3,700,000 to be used for double tracking and additional equipment. The bonds will be dated March 1, and will mature in 1930.

International & Great Northern.—This company has notified the railway commission of Texas that it wishes to issue $3,000,000 bonds at the rate of $1,000,000 a year to pay for building a line from San Antonio to Laredo, 150 miles, and from Valley Junction to Spring, 99 miles.
See also an item in regard to this company in General News.

Kansas City, Mexico, & Orient.—This company, through its president, Arthur E. Stilwell, is offering to its stockholders $10,000,000 10-year 5 per cent. first mortgage collateral trust bonds at par. The proceeds of the sale of these bonds are to be used to pay for building the main line from its present terminus at San Angelo, Tex. to Chihuahua, Mex., where connection with the National Railways of Mexico is made. The company had outstanding at last report $12,500,000 preferred stock; $12,264,135 common stock and $18,199,000 first mortgage 4 per cent. bonds of February 1, 1901-1951.

New Orleans, Mobile & Chicago.—Douglas Fenwick & Co., New York, are offering $450,000 first and refunding mortgage 5 per cent. bonds at 95, yielding 5.25 per cent. income on the investment. Control of the N. O. M. & C. was recently acquired by the St. Louis & San Francisco and the Louisville & Nashville.

New York Central & Hudson River.—The New York Public Service Commission, Second district (up-state) has approved the lease to the New York Central & Hudson River of the New York & Ottawa for one year beginning February 1, 1912. The lease is made each year and has been approved each year previously by the commission.

See an item in regard to this company and its sale of Rutland and purchase of New York, Ontario & Western in State Commission news.

New York, Ontario & Western.—See item in General News.

New York & Ottawa.—See New York Central & Hudson River.

Oregon Eastern.—See California Northeastern.

Rutland.—See an item in General News.

Southern Pacific.—See California Northeastern.

Virginian.—Stockholders have voted to increase the capital stock from $36,000,000 to $65,000,000. (Jan. 26, page 178.)

Wabash.—Kuhn, Loeb & Co., New York, have been awarded the entire issue of $10,000,000 Wabash receiver's certificates. The certificates were sold to the highest bidder and Kuhn, Loeb & Company bid $1,002.50 per $1,000 certificate. Other bids were Francis Brothers and Bond & Goodwin, $1,001.50 per certificate; Lee, Higginson & Co., Boston, $1,000.79; White, Weld & Co., William A. Reed & Co. and A. G. Edwards & Sons, $1,000.37. It is presumed that Kuhn, Loeb & Company represented the refunding bondholders' committee, of which Winslow Pierce is chairman, and the White, Weld-Edwards bid represented the refunding bondholders' protective committee, of which J. N. Wallace is chairman.
(See also item in General News.)